ARITHMETIC WE USE

GRADE 4

ARITHMETIC WE USE

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INTRODUCTION

Basic Plan of the Series. The modern arithmetic program recognizes two major phases of the subject, namely, the mathematical phase and the social phase. The purpose of the mathematical phase is to teach the nature of the number system. The purpose of the social phase is to help the pupil to understand and to utilize effectively the quantitative procedures that he will need daily in the social order of which he is a part.

The basis of instruction throughout this series of textbooks is (1) the number system and (2) its social significance. Through carefully planned activities the pupil is taught to understand the nature of the number system. This understanding insures a meaningful grasp of the procedures that are presented in the various computational processes. At the same time the pupil is led to see the social significance of arithmetic through the study of rich informational units of work dealing with everyday applications of number processes and quantitative procedures. In addition, numerous activities are suggested which require pupils to investigate social applications of arithmetic in their own communities. This plan insures a well integrated treatment of both phases of the subject.

Scientific Gradation of Subject Matter. To insure successful growth in arithmetic power, the authors have carefully considered the findings of important investigations of grade placement of arithmetic topics, and have made extensive surveys of their own, to determine the most satisfactory points at which to present the various elements of the work. As a result, the work of each grade has been considerably simplified and the teaching load greatly reduced. The teaching of a process is spread out over several years so that the easier phases are taught at least a year before the more difficult steps are introduced. For example, the use of fractions is begun in Grade 3 two years before the actual computational procedures are presented. This scientific gradation of the subject matter insures easy learning and mastery of the various processes.

The major phases of arithmetic first taught in Grade 4 are as follows:

1. Addition of longer columns.
2. Subtraction of four and more-place numbers.
3. Multiplication by one-figure numbers completed.
4. Even and uneven division process completed.
5. Work with fractions extended.

Basic Elements of a Readiness Program. Recent investigations by the authors and others have demonstrated conclusively that many pupils are not ready for the new work that is about to be presented. This may be due to the fact that they have had little, if any, previous contact with the topic to give it meaning, or it may be due to weaknesses in underlying skills that they have not yet mastered. Unless these deficiencies are discovered and corrected before the new work is begun, it is practically certain that serious maladjustments will result.

The authors have taken two major steps to insure pupil readiness for the new work. The first step has been to make certain that the pupil has direct contact with important concepts, for example the meaning of fractions, long before he is required to compute with them. The authors believe that meaning gained through experience should always precede practice for mastery. The second step has been the provision of a complete series of experimentally-developed readiness tests which enable the teacher to locate the pupils likely to have difficulty with the new work and to locate the points that are likely to lead to the difficulty. On the basis of the information revealed by these readiness tests, the teacher can either do any reteaching that may be required, or adjust the subsequent instruction in the new step to the needs of each individual.

Teaching Procedures that Insure Mastery of Arithmetic. These textbooks present an instructional program that has been thoroughly tested in hundreds of schools. They provide a systematic step-by-step development of the fundamental operations in such a way that each step is both mathematically meaningful and socially significant. Illustrations, pictures, diagrams, and other kinds of visual aids are extensively used to help the pupils to get an insight into the mathematical meaning of the step being presented. Following this concrete development of a step, there are worked-out models for study and solution before practice on the new step is begun. The explanations of procedure are specific and detailed so that the difficulties learners sometimes encounter in the study of arithmetic are reduced to a minimum. Diagnostic tests keyed to study helps and remedial practice are provided at frequent intervals to assist the teacher in locating pupils' needs for additional instruction. These tests make it possible for the teacher to provide effectively for individual differences. They also insure intelligent cooperation by the learner toward the correction of any difficulties he may encounter. The skills that have been taught are frequently reintroduced in the units of problem material to insure proper maintenance. Frequent mixed drills of a cumulative nature are

also provided. The problems illustrating the applications of the processes are stated in simple language that children understand.

Analysis of the Features of the Series. To assist teachers and members of textbook committees in their use and evaluation of this textbook, the detailed analysis of features given below is provided. Similar analyses for the other books of the series are included in each textbook. In instances where the number of page references that might be given is very large, only typical pages are listed. The reader should consult the index for additional details.

1. Recognition of the social phase of arithmetic

a. Problem units dealing with social applications of arithmetic: 1, 12, 23, 31, 38, 47, 50, 71, 72, 89, 97, 105, 108, 109, 111, 120, 125, 130, 136, 137, 138, 153, 164, 184, 203, 218, 220, 221, 222, 227, 231, 235, 236, 240, 245, 254, 255, 256, 257, 259, 263, 265, 268, 269

b. Correlations with other areas of the curriculum

(1) Health: 199, 259

(2) Social studies: 2, 15, 43, 135, 172, 181, 206, 228, 263, 269

(3) Science: 23, 139, 144, 148, 237, 265, 267, 268

(4) Arts and Music: 64, 169, 177, 258, 275

c. Wide variety of illustrations, pictures, and diagrams: 1, 12, 15, 23, 27, 31, 33, 34, 39, 56, 60, 64, 83, 89, 103, 108, 114, 122, 127, 130, 134, 136, 139, 144, 148, 152, 164, 172, 175, 177, 194, 195, 203, 218, 227, 228, 237, 238, 247, 250, 258, 268, 271

d. Vocabulary development: 22, 27, 30, 45, 77, 95, 133, 138, 151, 158, 162, 197, 203, 233, 261, 274, 278

2. Meaningful mathematical development of number processes

a. Consideration of the nature of the number system as such: 65, 74, 75, 76, 87, 92, 102, 202, 203, 204, 205, 213, 216, 242

b. Concrete presentation of related groups of number facts

(1) Multiplication: 68, 70, 112, 114, 154, 160, 170, 173, 210, 212, 246

(2) Division: 83, 122, 165, 175, 223, 250

c. Relationships between processes stressed: 18, 36, 57, 59, 66, 82, 112, 116, 140, 142, 156, 162, 195, 213

d. Step by step development of number processes

(1) Extension of addition: 101, 102, 104

(2) Extension of subtraction: 107, 200, 208

(3) Extension of multiplication: 79, 80, 81, 82, 116, 117

(4) Extension of division: 57, 58, 59, 60, 61, 62, 66, 85, 90, 98, 118, 119, 124, 140, 142, 167, 178, 225, 241, 252

(5) Extension of fractions: 84, 123, 126, 127, 194, 195, 271, 272, 273, 276

e. Models for study and solution for each step presented: 59, 61, 67, 79, 80, 81, 90, 98, 101, 116, 117, 118, 119, 140, 142, 200, 208, 241

f. Practice on new steps: 59, 61, 67, 69, 71, 79, 80, 81, 83, 86, 91, 99, 101, 103, 104, 107, 113, 115, 116, 117, 119, 123, 141, 143, 155, 161, 166, 170, 171, 173, 176, 201, 209, 211, 212, 224, 225, 246, 248, 251

g. Diagnostic tests keyed to study helps: 45, 91, 94, 121, 131, 146, 149, 188, 192, 229, 230, 264, 266, 270, 274

h. Mixed practice to insure retention of skills presented: 24, 29, 44, 49, 54, 63, 67, 73, 77, 86, 88, 91, 95, 99, 109, 110, 111, 113, 125, 128, 129, 143, 145, 155, 161, 164, 166, 168, 169, 171, 174, 176, 179, 182, 191, 206, 211, 213, 214, 217, 224, 226, 227, 244, 247, 248, 249, 251, 253, 255, 259, 269

3. Development of power to apply quantitative procedures

a. Use of visualization to aid pupils to sense situations: 4, 12, 43, 47, 57, 60, 64, 72, 89, 105, 122, 127, 139, 165, 177, 181, 195, 199, 218, 222, 223, 235, 262, 265, 267

b. Special helps on problem solving: 9, 10, 21, 22, 23, 30, 37, 39, 40, 41, 51, 52, 53, 157, 158, 159, 162, 163, 180, 183, 185, 186, 187, 189

c. Original problems to be prepared by pupils: 4, 20, 49, 143, 177, 195, 219, 254

d. Pictures and illustrations to be discussed: 1, 46, 96, 134, 152, 194, 198, 228, 234, 262, 268, 271

e. Groups of unrelated problems for test and practice: 42, 54, 174, 190, 193, 201, 209, 214, 217

4. Comprehensive testing program

a. Inventory tests: 2, 3, 16, 17, 44, 88, 128, 145, 182

b. Readiness tests on new work to be presented

(1) Addition: 100 (2) Subtraction: 106 (3) Multiplication: 78 (4) Division: 55, 56

c. Periodic cumulative keyed diagnostic tests: 45, 91, 94, 121, 131, 146, 149, 188, 192, 229, 230, 264, 266, 270, 274

d. Problem scales for measuring power in problem solving: 8, 93, 132, 150, 196, 232, 260, 277

e. Chapter reviews: 45, 95, 133, 151, 197, 233, 261, 278

5. Adaptation of instruction to individual differences

a. See the comprehensive testing program outlined under **4** for locating needs

b. Review work of Grade 3, keyed to study helps

(1) Addition: 5, 6, 7, 11, 13, 14

(2) Subtraction: 18, 19, 20, 48, 49

(3) Multiplication: 25, 26, 28

(4) Division: 35, 36

c. Starred problems and activities for enrichment and for the more able pupils: 4, 20, 31, 38, 49, 76, 86, 89, 92, 97, 105, 108, 123, 130, 135, 136, 141, 143, 144, 147, 148, 156, 184, 193, 203, 206, 215, 231, 237, 239, 240, 243, 253, 257, 259, 265, 267, 268, 270, 275

d. Practice cards for individual study of combinations: 2, 16, 27, and so on whenever a new group of facts is presented.

Acknowledgments. The authors wish to make special acknowledgment of the numerous helpful suggestions by Mr. Lyle Hance which have added much to the merit of the materials included in these textbooks. The authors also wish to acknowledge the contributions of the many principals, supervisors, and teachers who have given generously of their time and energy in the experimental work underlying the series.

GRADE IV

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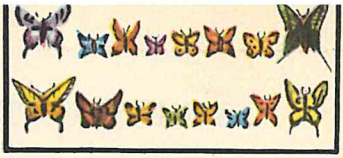
CHAPTER I

We Meet Our Number Friends Again

BACK HOME AGAIN!



1. Betty and Jack have come home from camp. They are putting their rooms in order. What date is Betty marking on the calendar? What special day is this?

2. Jack brought home his collection of airplane models. He has 11 in all. He has put 6 on the shelf. The rest he will take to school. How many will he take to school?

3. Mother says they have 20 minutes more to work before dinner is ready. It is now 5:40. At what time will they have dinner?

4. Jack paid one dollar and twenty-five cents for the ship's compass. Write this amount in figures.

5. Jack is measuring the snakeskin he brought from camp. What kind of measure is he using?

6. What kind of measure would you use to find how high the window is in Betty's room?

7. Betty has her doll family in one corner of the room. She has bought some new dishes for her doll's kitchen. She paid 8¢ for a milk pitcher, 5¢ for a pepper and salt set, and 4¢ for spoons. How much did she pay for them all?

8. Jack caught and mounted 16 butterflies. Betty has 12. How many butterflies did both Jack and Betty collect?

9. Betty can put 8 books on one shelf in her bookcase. How many books can she put on 2 shelves?

10. Jack made a kite at camp. He bought a ball of string for 10 cents. How much change did he receive from a quarter?

STUDYING THE ADDITION COMBINATIONS

How well do you remember the 100 addition combinations?

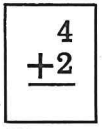
Study the sums on pages 2 and 3. Then cover the answers and write the sums on a folded paper.

Set 1: Sums from 0 to 6

2	0	5	3	2	0	3
1	5	1	0	3	1	3
3	5	6	3	5	1	6
2	1	0	4	0	3	1
0	2	6	0	0	1	5
2	3	6	4	0	4	6
0	3	0	4	5	0	1
4	2	3	2	0	2	1
4	5	3	6	5	2	2
2	1	6	1	2	1	4
4	0	0	4	2	3	1
6	1	6	5	4	4	5

Making Practice Cards

Your teacher will give you small oak-tag cards for practicing combinations you need to study. Write the combination on one side of the card and the combination and answer on the other side. Use the combination and answer side of the card for study. Use the side with the combination only to test yourself.



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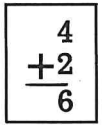


Back

Study and learn the combinations in Set 1 before you go on to the more difficult sets on page 3.

STUDYING THE ADDITION COMBINATIONS

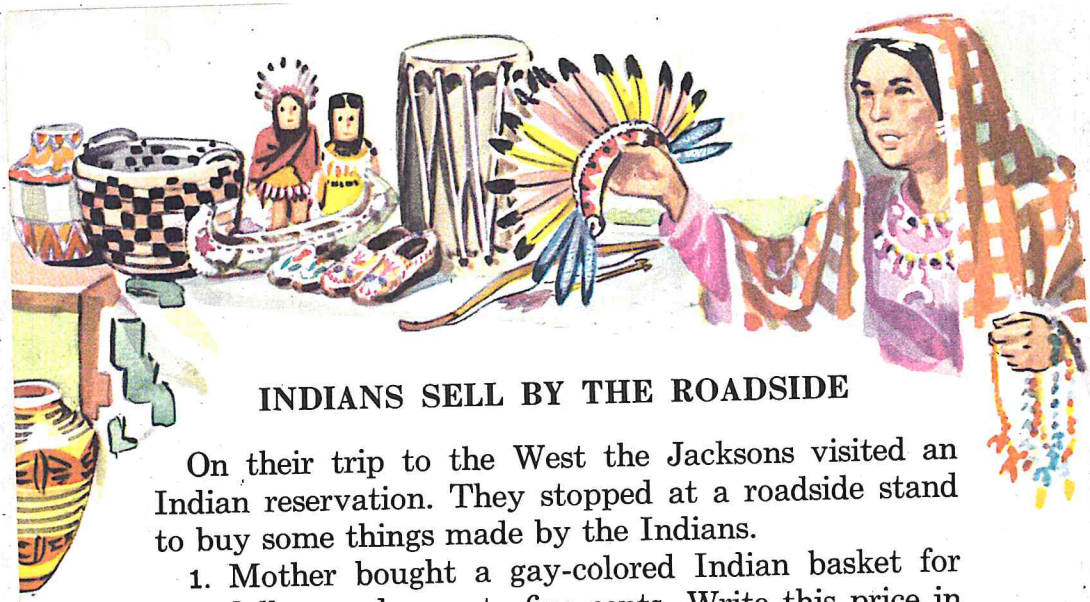
Study these combinations as you did on page 2.

Set 2: Sums from 7 to 10

6	3	9	7	3	2	1	9	3
2	4	1	0	5	8	6	0	7
8	7	10	7	8	10	7	9	10
4	2	4	1	6	4	6	8	5
3	6	6	8	3	4	1	2	5
7	8	10	9	9	8	7	10	10
4	7	1	5	0	1	0	7	2
5	3	7	2	7	9	8	1	7
9	10	8	7	7	10	8	8	9
8	5	0	5	8	6	3	2	7
0	4	9	3	1	4	6	5	2
8	9	9	8	9	10	9	7	9

Set 3: Sums from 11 to 18

8	7	3	5	7	9	6	3	9
4	9	8	9	5	2	6	9	9
12	16	11	14	12	11	12	12	18
7	8	9	4	5	2	9	6	4
7	3	6	7	8	9	4	9	8
14	11	15	11	13	11	13	15	12
6	7	9	5	9	8	7	7	9
5	8	8	6	5	9	4	6	7
11	15	17	11	14	17	11	13	16
9	8	8	5	4	6	6	8	8
3	8	6	7	9	8	7	7	5
12	16	14	12	13	14	13	15	13



INDIANS SELL BY THE ROADSIDE

On their trip to the West the Jacksons visited an Indian reservation. They stopped at a roadside stand to buy some things made by the Indians.

1. Mother bought a gay-colored Indian basket for two dollars and seventy-five cents. Write this price in figures.

2. Jack bought a bow and arrows for 65 cents and a tiny birchbark canoe for 15 cents. How much did he pay for both?

3. Polly bought a pair of Indian dolls. The Indian chief cost 80 cents. The squaw cost 75 cents. How much more than the squaw did the chief cost?

4. Gay-colored strings of beads sold at 25 cents each. What did Mrs. Jackson pay for 3 strings?

5. Father bought Jack an Indian headband made with feathers. It had 6 yellow feathers, 5 blue feathers, and 7 red feathers. How many feathers were there in all?

6. Polly bought 3 colored postcards for 15 cents. How much did the cards cost apiece?

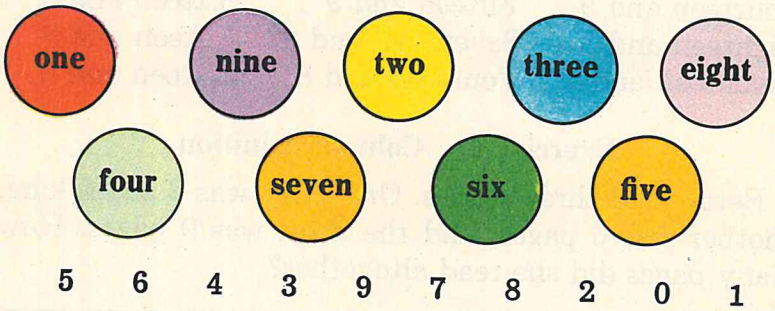
*7. Make up a problem about buying one of these:

tom-tom moccasins beads Indian doll canoe

STUDY HELPS FOR COLUMN ADDITION

Exercise 1. Adding a Seen Number to a Thought-of Number

Choose one of the number names in these circles. Add it to each of the numbers below. Do this with each of the number names in the circles.



Exercise 2. Finding Sums Below Twenty

Ten and 8
Eleven and 6
Ten and 6
Twelve and 7
Fifteen and 3
Twelve and 1
Eleven and 0
Fifteen and 0
Twelve and 2
Ten and 3
Fourteen and 3
Ten and 9
Twelve and 3

Twelve and 4
Fourteen and 2
Twelve and 0
Fifteen and 4
Ten and 5
Fourteen and 4
Seventeen and 2
Ten and 4
Sixteen and 1
Eleven and 4
Ten and 0
Eleven and 7
Sixteen and 2

Eleven and 8
Twelve and 5
Fourteen and 5
Thirteen and 6
Eleven and 3
Ten and 7
Thirteen and 4
Twelve and 6
Eleven and 2
Thirteen and 5
Seventeen and 0
Thirteen and 2
Eleven and 5

Exercise 3. Finding Sums Over Twenty

Fourteen and 7	Thirteen and 8	Eighteen and 9
Sixteen and 8	Seventeen and 7	Seventeen and 6
Eighteen and 3	Twelve and 9	Fifteen and 7
Eighteen and 8	Eighteen and 7	Sixteen and 7
Fifteen and 6	Seventeen and 4	Seventeen and 5
Eighteen and 2	Thirteen and 9	Eighteen and 4
Fourteen and 9	Fifteen and 9	Sixteen and 9
Eighteen and 5	Seventeen and 8	Fifteen and 8
Seventeen and 9	Fourteen and 8	Sixteen and 6

Exercise 4. Column Addition

Betty read three stories. One story was 8 pages long, another was 6 pages, and the third was 9 pages. How many pages did she read altogether?

8	Begin at the top and add down.
6	8
9	See 6. Think fourteen. Add fourteen and 9.
23	Write 23. Betty has read 23 pages.

To check, add from the bottom up. Think 9 and 6 is fifteen. Fifteen and 8 is 23.
If both sums are the same, the work checks.

Tell how these sums were found in each set below.

Set 1		Set 2		Set 3		Set 4	
3	5	7	9	9	4	5	7
2	0	4	5	8	8	6	9
5	8	6	3	7	9	9	6
10	13	17	17	24	21	4	8
						24	30

LET'S PRACTICE

1

	a	*b*	*c*
1. p. 5 Ex. 1	Nine and 4	Eight and 6	Seven and 9
2. p. 5 Ex. 2	Thirteen and 5	Twelve and 7	Fourteen and 3
3. p. 6 Ex. 3	Sixteen and 8	Twelve and 9	Eighteen and 7

	a	*b*	*c*	*d*	*e*	*f*	*g*
4. p. 6 Ex. 4 Set 1	5 3 4 —	2 7 1 —	6 2 7 —	9 0 6 —	7 2 5 —	4 1 8 —	6 3 4 —
5. p. 6 Ex. 4 Set 2	8 5 6 —	4 9 2 —	7 6 6 —	9 7 2 —	7 3 8 —	4 9 3 —	8 7 4 —
6. p. 6 Ex. 4 Set 3	6 9 8 —	8 4 9 —	9 6 5 —	9 3 8 —	8 9 8 —	7 6 8 —	9 8 5 —
7. p. 6 Ex. 4 Set 4	8 6 9 3	8 9 7 9	7 0 9 8	4 9 8 6	7 5 9 8	8 3 9 7	4 9 7 8

MEASURING YOUR ABILITY IN PROBLEM SOLVING I

1. George has 4 apples. Kate has 8 apples. How many apples have George and Kate together?

2. Will bought some pencils at 5 cents each. How much did he pay for 3 pencils?

3. Jane has 15 cents. Her father gives her 10 cents. Then how many cents has Jane in all?

4. There are 5 school days in each week. How many school days are there in 2 weeks?

5. Ann has 3 bunches of flowers. There are 6 flowers in each bunch. How many flowers has Ann in all?

6. Tom has 38 cents. How many cents more must he have before he can buy a toy truck that costs 80 cents?

7. Patty has 48 cents. Betty has 72 cents. How many cents more than Patty has does Betty have?

8. Mary's mother paid 96 cents for 3 dozen eggs. How much did the eggs cost a dozen?

9. John bought some butter at 38 cents a pound. How much did John pay for 2 pounds of butter?

10. In a school garden there were 3 equal rows of plants. In all there were 60 plants. How many plants were there in each row?

Your score is the number of problems you have correct. Look at the chart below to find out how well you solve problems.

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

HOW TO READ AND SOLVE PROBLEMS

It will help you to solve problems if you will read each problem carefully. Here are two helps for reading arithmetic problems.

HELP 1. Read the problem through to make sure that you know all of the words. You should know how to pronounce them and know what they mean.

HELP 2. Read the problem again to make sure you have grouped the words together to give the right meaning. See how the words are grouped together in the problem below.

In the field day games | each race counted 8 points | for the winner. | Ned won 3 races. | How many points did he win | in the 3 races?

Tell how you would solve each problem below, using the problem helps given here. Then work each problem.

a. Find the meaning of any words you do not know.

b. Group the words to make the meaning clear.

c. Tell what the problem asks you to find.

d. What numbers will you use to solve the problem?

e. Will you add, subtract, multiply, or divide?

1. At the picnic 18 children were grouped in 2 equal teams for a peanut race. How many children were there on each team?

2. Janet had 85¢ in the city savings bank. She deposits 15¢ more. How much has she in the bank?

3. Mother bought a piece of meat for 35 cents. How much change should she receive from a 50-cent piece?

WHY DO WE ADD?

1. Roger had 3 airplanes. He bought 2 more. How many airplanes did he then have?

Roger had some airplanes. He bought more airplanes. In this way he got more than he had at first. You must add to find how many airplanes he now has.

In some addition problems something happens to give you more than you had at first. You must add to find how many you will then have.

Here are ways in which you can get more than you had at first when you already have some. Make up an addition problem for each of these ways: find, buy, earn, save, make, get or receive.

2. Edith has read 6 books. Sue has read 4 books. How many books have the two girls read together?

When a problem asks you to put together two or more numbers of the same kind, you should add.

In an addition problem you are asked to put together numbers of the same kind to find their sum.

The question of the problem may ask you to find the sum in one of these ways:

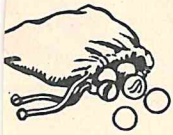
both	together	for all	the two
total	altogether	in all	the three

3. Jerry earned 5¢ on Monday, and 3¢ on Tuesday. How much did he earn on both days?

What does the word **both** mean in the question?

4. Make up an addition problem using each of the above ways of asking you to find the sum.

HOW TO WORK ADDITION EXAMPLES



There were 19 marbles in Ted's marble bag. There were 38 marbles in Jerry's. How many marbles did the two boys have together?

Step 1

$$\begin{array}{r} 19 \\ \underline{38} \\ 7 \end{array}$$

19 is 1 ten and 9 ones; 38 is 3 tens and 8 ones. Add the ones from the top down.

9 9 ones

See $\underline{+8}$. This is $\underline{+8 \text{ ones}}$. Think 17. 17 is 1 ten and 7 ones. Write the 7 in the ones' place. Carry the 1 ten to the **upper** figure in the tens' place.

Step 2

$$\begin{array}{r} 19 \\ \underline{38} \\ 57 \end{array}$$

1 1 ten

See $\underline{3}$. Think $\underline{3 \text{ tens}}$. Add the 1 ten you carried in your mind to the 1 ten.

1 2

You see $\underline{3}$ but you think $\underline{3}$. Write the 5 tens in the tens' column.

To check, cover the sum and add from the bottom up.

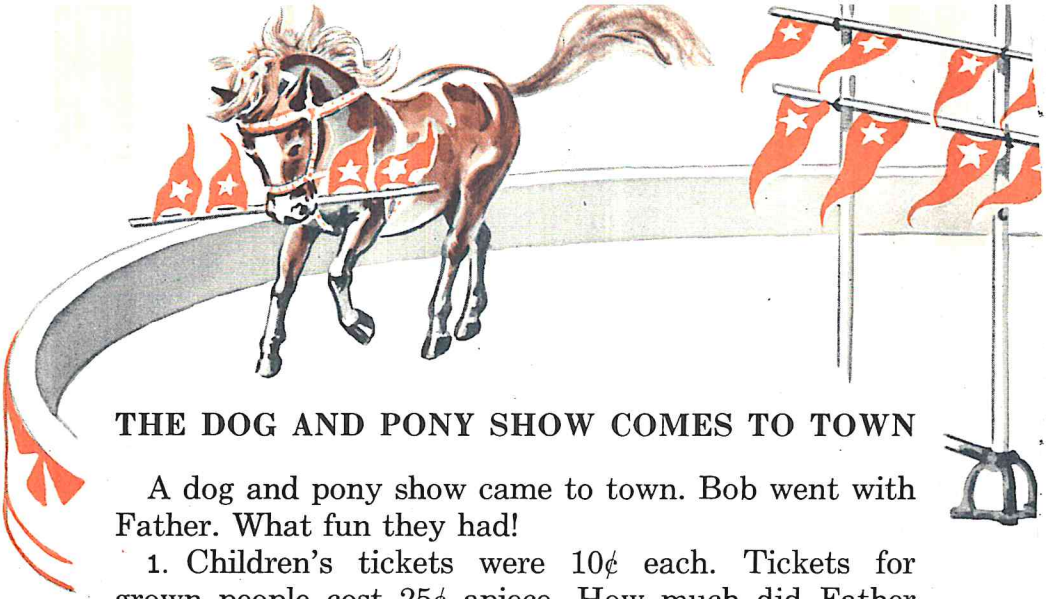
9

Step 1. See 8. Think 8 and 9 is 17. Write the 7 ones in the ones' column and carry the 1 ten to the **lower** figure of the tens' column.

Step 2. Think 4 and 1 is 5. Write 5. If the two sums are the same, your work checks.

Tell how each sum is found. Name the missing numbers.

a.	46	69	84	306	*b.* 264	445	58
	3	87	8	479	375	179	66
	49	156	92	785	??9	??4	??4



THE DOG AND PONY SHOW COMES TO TOWN

A dog and pony show came to town. Bob went with Father. What fun they had!

1. Children's tickets were 10¢ each. Tickets for grown people cost 25¢ apiece. How much did Father have to pay for the tickets for himself and Bob?

2. Queenie, the star dog, walked the tightrope. She walked 9 steps on the rope. Then she turned around and walked back 8 steps more. How many steps did she walk in all on the tightrope?

3. Trixie climbed a ladder 18 rungs high. But Queenie climbed a ladder 37 rungs high. How many rungs higher was Queenie's ladder than Trixie's?

4. Bob saw the ponies acting in two rings. There were 6 ponies in one ring. There were 12 ponies in the other ring. How many ponies were there in both rings?

5. There were 25 dogs in the ring. Nine dogs left the ring. How many dogs remained in the ring for the act?

6. How many colored flags are now on the frame in the picture above? How many more flags will the pony place on the frame? Then how many flags will be on the frame?

HELPS FOR WORKING ADDITION EXAMPLES

Explain how to work each set of examples below. Each set contains a step in addition that you have already learned. Then copy the examples and find the sums with your book closed. Check each example.

Set 1

36	80	34	50
42	20	92	88
78	100	126	138

Set 2

15	42	6	4
4	7	20	35
19	49	26	39

Set 3

48	73	59	64
57	87	66	79
105	160	125	143

Set 4

76	97	4	2
4	8	97	68
80	105	101	70

Set 5

423	275	641
360	504	345
783	779	986

Set 6

306	746	229
528	128	367
834	874	596

Set 7

290	657	285
457	252	360
747	909	645

Set 8

459	268	177
243	593	446
702	861	623

Set 9

679	46	89
58	297	794
737	343	883

Set 10

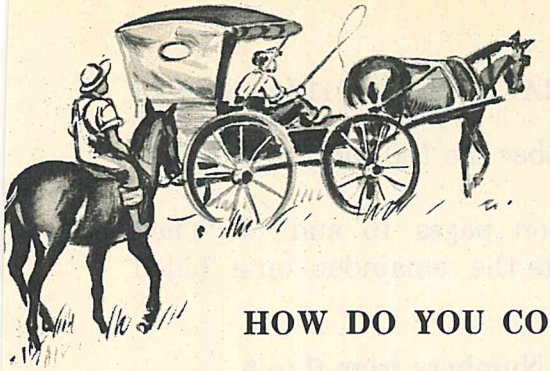
304	9	8
6	792	509
310	801	517

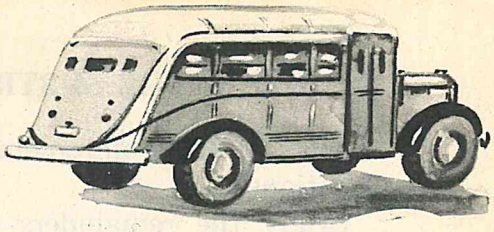
LET'S PRACTICE

2

Use the examples below for practice in addition. Turn to page 13 for help if you miss any examples.

	a	*b*	*c*	*d*	*e*	*f*
1.	72	34	45	56	70	72
Set 1	15	45	70	93	30	86
2.	13	4	52	51	6	7
Set 2	5	23	3	8	42	32
3.	46	87	16	37	46	79
Set 3	59	56	84	89	38	26
4.	57	3	28	61	9	8
Set 4	5	79	7	9	58	46
5.	403	260	831	172	503	280
Set 5	282	715	136	204	476	206
6.	513	128	119	538	336	128
Set 6	358	165	567	219	147	345
7.	430	535	546	380	152	294
Set 7	479	381	260	384	781	510
8.	137	225	359	449	682	148
Set 8	497	375	569	274	239	364
9.	146	770	28	84	810	84
Set 9	95	43	903	629	92	808
10.	249	2	1	752	640	4
Set 10	5	680	730	8	1	399





HOW DO YOU COME TO SCHOOL?

The pictures show some of the ways boys and girls came to school long ago and how they come now.

1. "When Grandpa was a boy, he rode horseback the 5 miles from his farm to school," said William. How many miles did he ride to and from school each day?

2. The school bus in which Ella comes to school brings 32 children on the first trip and 31 on the second. How many children come to school on both trips?

3. John said, "My dad had to walk 2 miles to school." If John's father walked the two miles in 40 minutes, how long did it take him to walk a mile?

4. When school began this year, Henry needed one new tire for his bicycle. The tire cost three dollars and forty-five cents. Write this amount in dollars and cents.

5. Mary said, "My grandfather says that he went to school with a horse and buggy. He would leave home at 8 o'clock and get to school at 9 o'clock." How long did it take Mary's grandfather to drive to school?

6. Mary comes to school on the street car. School children's tickets are 3 cents a ride. How much would Mary have to pay for 4 tickets?

*7. Find how many ways the pupils in your room come to school. Who lives the farthest away from your school?

STUDYING THE SUBTRACTION COMBINATIONS

How well do you remember the 100 subtraction combinations?

Study the remainders on pages 16 and 17. Then cover the answers and write the remainders on a folded paper.

Set 1: Subtracting Numbers from 0 to 6

5	3	2	4	3	6	4
−3	−2	−2	−0	−2	−5	−3
2	1	0	4	1	1	1
5	2	4	5	6	4	3
−5	−1	−2	−1	−4	−4	−0
0	1	2	4	2	0	3
3	6	1	5	6	0	6
−1	−0	−0	−2	−1	−0	−3
2	6	1	3	5	0	3
1	2	4	5	6	5	6
−1	−0	−1	−0	−2	−4	−6
0	2	3	5	4	1	0

Making Practice Cards

Make your Practice cards for combinations you need to study as you did for the addition combinations on pages 2 and 3. It will help you to learn the subtraction combinations you have forgotten, if you will study with a partner. Test your partner on his pack of cards. Then let your partner test you on your pack of cards.

STUDYING THE SUBTRACTION COMBINATIONS

Set 2: Subtracting Numbers from 7 to 10

7	9	8	9	7	10	9	8	7
−2	−4	−6	−9	−0	−2	−1	−4	−6
5	5	2	0	7	8	8	4	1
10	8	7	9	10	9	8	7	10
−4	−2	−5	−8	−6	−2	−8	−1	−8
6	6	2	1	4	7	0	6	2
9	8	7	10	9	8	9	8	10
−3	−1	−3	−3	−7	−7	−6	−0	−1
6	7	4	7	2	1	3	8	9
7	9	10	9	8	7	10	8	10
−4	−5	−5	−0	−3	−7	−7	−5	−9
3	4	5	9	5	0	3	3	1

Set 3: Subtracting Numbers from 11 to 18

12	11	14	13	15	11	16	11	14
−5	−7	−9	−7	−7	−3	−8	−5	−6
7	4	5	6	8	8	8	6	8
12	14	15	17	11	12	14	13	11
−4	−8	−9	−9	−2	−9	−7	−4	−9
8	6	6	8	9	3	7	9	2
12	11	15	13	12	17	14	13	16
−6	−6	−8	−5	−8	−8	−5	−8	−7
6	5	7	8	4	9	9	5	9
11	15	18	13	11	12	16	13	12
−4	−6	−9	−9	−8	−7	−9	−6	−3
7	9	9	4	3	5	7	7	9

HOW TO WORK SUBTRACTION EXAMPLES

Pine Lake is 403 miles from home. When we have gone 198 miles, how much farther must we go?

Step 1

$$\begin{array}{r} 403 \\ -198 \\ \hline 5 \end{array}$$

First see $\begin{array}{r} 3 \\ -8 \end{array}$. This is $\begin{array}{r} 3 \text{ ones} \\ -8 \text{ ones} \end{array}$. Think: I cannot take 8 ones from 3 ones. I cannot take a ten and change it to 10 ones for there are no tens. I will take 1 hundred and change it to 10 tens, then change 1 of the 10 tens to 10 ones. I will add the 10 ones to the 3 ones. This will make 13 ones.

Step 2

$$\begin{array}{r} 403 \\ -198 \\ \hline 05 \end{array}$$

See $\begin{array}{r} 3 \\ -8 \end{array}$. Think $\begin{array}{r} 13 \text{ ones} \\ -8 \text{ ones} \end{array}$. Write 5. Where?

Then see $\begin{array}{r} 0 \\ -9 \end{array}$. Think: $\begin{array}{r} 0 \text{ tens} \\ -9 \text{ tens} \end{array}$. There are 9 tens left from the 10 tens I took.

Step 3

$$\begin{array}{r} 403 \\ -198 \\ \hline 205 \end{array}$$

Think: $\begin{array}{r} 9 \text{ tens} \\ -9 \text{ tens} \end{array}$. Write 0. Where?

Because I took 1 of the hundreds, when I see $\begin{array}{r} 4 \\ -1 \end{array}$ I think $\begin{array}{r} 3 \text{ hundreds} \\ -1 \text{ hundred} \end{array}$. Write 2 in the hundreds' place. We must go 205 miles.

To Check:

$$\begin{array}{r} 403 \\ -198 \\ \hline 205 \end{array} > 403$$

Add 198 and 205. The sum, 403, is the same as the number from which you subtracted 198.

Tell how each remainder is found. Find the missing numbers. Check the work.

a.

$$\begin{array}{r} 76 \\ -43 \\ \hline 33 \end{array} \quad \begin{array}{r} 526 \\ -409 \\ \hline 117 \end{array} \quad \begin{array}{r} 837 \\ -485 \\ \hline 352 \end{array} \quad \begin{array}{r} 640 \\ -398 \\ \hline 242 \end{array}$$

b.

$$\begin{array}{r} 705 \\ -238 \\ \hline 4?7 \end{array} \quad \begin{array}{r} 709 \\ -45 \\ \hline 6?4 \end{array} \quad \begin{array}{r} 860 \\ -9 \\ \hline ??1 \end{array}$$

HELPS IN SUBTRACTION

Explain how to work each set of examples below. Then copy and work the examples.

Set 1

58	69	73	48
−32	−40	−53	−27
26	29	20	21

Set 2

58	37	78	27
−6	−7	−0	−6
52	30	78	21

Set 3

49	82	69	57
−43	−82	−67	−50
6	0	2	7

Set 4

53	75	97	62
−35	−37	−39	−17
18	38	58	45

Set 5

90	80	30	60
−54	−49	−17	−21
36	31	13	39

Set 6

51	24	40	76
−8	−9	−8	−7
43	15	32	69

Set 7

90	41	64	52
−86	−35	−58	−43
4	6	6	9

Set 8

673	975	296
−212	−644	−193
461	331	103

Set 9

453	894	980	746
−324	−325	−852	−465
129	569	128	281

Set 10

419	800	650
−225	−250	−353
194	550	297

Set 11

403	941	606	322
−199	−164	−69	−48
204	777	537	274

Set 12

157	498	685
−88	−9	−8
69	489	677

Set 13

893	506	303	802
−8	−8	−7	−9
885	498	296	793

Set 14

LET'S PRACTICE

3

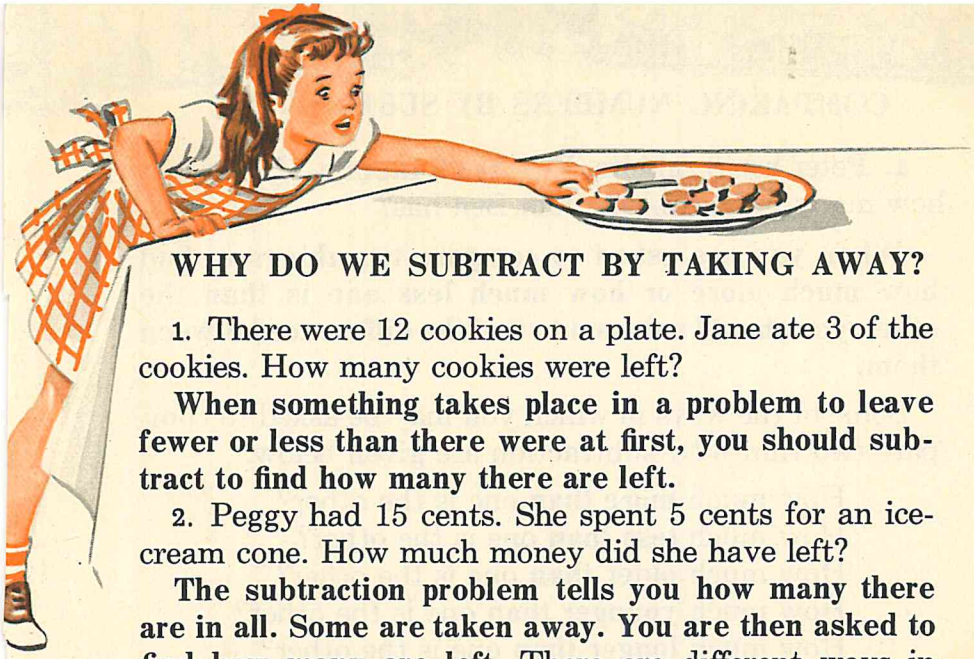
If you miss any examples on this page, turn to page 19 and study the set of models which shows you how to do the example you missed. Then correct your mistakes.

	a	*b*	*c*		*a*	*b*	*c*
1. Set 1	85 − 62	68 − 40	39 − 24	2. Set 2	37 − 5	69 − 0	84 − 4
3. Set 3	39 − 37	69 − 69	26 − 20	4. Set 4	76 − 27	84 − 38	95 − 56
5. Set 5	90 − 74	50 − 31	40 − 28	6. Set 6	77 − 9	23 − 4	50 − 7
7. Set 7	74 − 65	56 − 48	80 − 79	8. Set 8	685 − 530	791 − 251	988 − 351
9. Set 9	765 − 627	481 − 213	670 − 236	10. Set 10	528 − 247	933 − 180	717 − 467
11. Set 11	802 − 699	613 − 366	972 − 376	12. Set 12	401 − 49	940 − 92	863 − 87
13. Set 13	714 − 6	273 − 5	968 − 9	14. Set 14	305 − 9	505 − 8	104 − 9

*For Those Who Do Not Need More Practice

Find out how many players are needed for a team for each of the following games:

a. baseball *b*. football *c*. boys' basketball
d. tennis *e*. ice hockey *f*. girls' basketball



WHY DO WE SUBTRACT BY TAKING AWAY?

1. There were 12 cookies on a plate. Jane ate 3 of the cookies. How many cookies were left?

When something takes place in a problem to leave fewer or less than there were at first, you should subtract to find how many there are left.

2. Peggy had 15 cents. She spent 5 cents for an ice-cream cone. How much money did she have left?

The subtraction problem tells you how many there are in all. Some are taken away. You are then asked to find how many are left. There are different ways in which to get a smaller number of things than there were at first. Here are some of them:

lose give away eat spend sell break

3. Make up a subtraction problem for each of the ways in which you may get less than you had at first.

In a subtraction (taking away) problem you are asked to find how many are left. There are different ways of asking you how many things are left after some have been taken away. Here are some of the ways:

How many are left?
How many did he still have?
How many remain?
How much change should you receive?

4. Make up a subtraction problem for each of the above ways of asking you how many are left.

COMPARING NUMBERS BY SUBTRACTING

1. **Peter has 8 rabbits. Ben has 5 rabbits.** Peter has how many more rabbits than Ben has?

When you are asked to compare two things to find how much more or how much less one is than the other, you should subtract to find the difference between them.

Some of the ways in which you may be asked to compare two things by subtraction are given below:

How much **more than** one is the other?
How much **less than** one is the other?
How much **older than** one is the other?
How much **younger than** one is the other?
How much **longer than** one is the other?
How much **shorter than** one is the other?
How much **farther than** one is the other?
What is the difference between the two?
How many more are needed?
Which is the greater?

2. Make up subtraction problems in which you compare two things in each of the ways given above.

Other Problem Helps Which You Should Know

1. Make a picture of the problem in your mind, or draw a picture of the problem on paper. Then try to see what is taking place in the problem.

2. If the numbers in the problem are large, it will help you to understand the problem if you make up another problem like it, using smaller numbers.

PUPPIES THAT WON'T SIT STILL

John has two black Scotty puppies, Mac and Sandy. He wanted to know how much more one weighed than the other. He tried and tried to weigh them, but they always jumped off the scales.

How could he find the difference between the weights of his two puppies? Can you tell?

The pictures below show you how John found their weights.

A.

B.

C.

1. First, John took a puppy under each arm and got on the scales as in Picture A. In all, the three weighed 74 pounds.

2. Next, John took only Mac under his arm as in Picture B. Together John and Mac weighed 69 pounds. How could John then find the weight of Sandy?

3. Last of all, John stood on the scales alone as in Picture C. He weighed 62 pounds. How did he now find how much Mac weighed?

4. How much did Sandy weigh in problem 2? How much did Mac weigh in problem 3? Then how much more did one puppy weigh than the other?

*5. How much do you weigh? Which child in your class weighs the most? Which child weighs the least?

LET'S PRACTICE

Try to work every example on this page correctly. 4

Set 1 + Addition +

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	23	54	4	96	7	6	8
	64	80	35	4	2	5	6
					5	6	9
							7
2.	37	307	290	495	717	8	393
	88	256	597	285	84	789	9

Set 2 — Subtraction —

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	76	36	85	54	34	158	97
	45	30	85	4	0	65	28
2.	70	73	80	796	609	534	702
	56	68	3	269	590	298	93

Problems to Read and Do

1. There are 14 examples in Nancy's arithmetic lesson. She has finished 9 of them. How many more examples must she work?

2. Joe is listening to his favorite supper-hour radio programs. The first program lasts 15 minutes. The other is a 30-minute program. How many minutes long are the two programs together?

3. Do you know how many keys there are on a piano? Betty counted them. There are 52 white keys and 36 black keys. How many keys are there in all? How many more white keys than black keys are there?

THE TWOS IN MULTIPLICATION

Each of the five boys has 2 nickels. To find how many nickels the boys have together, you can **count** the nickels. You can see 2+2+2+2+2 nickels. This is adding. The shortest way is to think 5 twos.

$$\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$$

This is multiplying. It is shorter than counting or adding when the numbers to be added are the same.

0	1	2	3	4	5	6	7	8	9
×2	×2	×2	×2	×2	×2	×2	×2	×2	×2
0	2	4	6	8	10	12	14	16	18
	2	2	2	2	2	2	2	2	2
	×1	×2	×3	×4	×5	×6	×7	×8	×9
	2	4	6	8	10	12	14	16	18

Practice by writing the products on a folded paper placed below each row of multiplication examples.

0	2	2	8	2	6	2
2	6	4	2	5	2	9
9	2	5	7	3	2	1
2	1	2	2	2	7	2
2	4	2	2	6	9	2
8	2	2	3	2	2	8

Make Practice Cards for the twos you do not know.

Practice in Carrying. Multiply each number below by 2 and add 1 to the product:

9 3 8 4 6 1 7 2 5 0

*Note to the teacher: See Manual for suggestions for use of Practice cards in learning combinations.

STUDYING THE MULTIPLICATION COMBINATIONS OF THREE

How well do you remember the multiplication combinations of three? Study the products below. Show with objects that multiplying is a short way of adding.

0	1	2	3	4	5	6	7	8	9
×3	×3	×3	×3	×3	×3	×3	×3	×3	×3
0	3	6	9	12	15	18	21	24	27
	3	3	3	3	3	3	3	3	3
	×1	×2	×3	×4	×5	×6	×7	×8	×9
	3	6	9	12	15	18	21	24	27

Now cover the products above and practice the multiplication combinations in the rows below. Check your answers with the products given above.

Practice by writing the answers on a folded paper placed below the examples.

3	3	8	3	3	3	5
2	9	3	5	1	4	3
3	3	3	7	0	3	2
8	3	6	3	3	8	3
4	9	1	3	6	9	3
3	3	3	7	3	3	8

Make a Practice card for any combination you need to study.

Practice in Carrying. Multiply each number below by 3 and add 1 to the product:

1 7 2 5 0 9 6 3 8 4

Multiply each number by 3 and add 2 to the product.

FINDING NUMBER NAMES FOR CLOWNS

1. What is the number of:

the second clown?	the eighth clown?
the fifth clown?	the sixth clown?
the first clown?	the seventh clown?
the tenth clown?	the fourth clown?
the third clown?	the ninth clown?

2. Change the clowns' numbers. Add 7 to each clown's number. Change their names again by adding:

two	nine	eight	four	five
six	three	one	seven	ten

3. Change the clowns' numbers again. Choose any number from 11 to 19 and add it to each clown's number.

4. On another day give the clowns new numbers by choosing any number from 20 to 30 and adding it to each clown's number.

5. Here is still another way to change their names. Multiply each clown's number by 2.

6. What will each clown's number be if you multiply it by 3?

HOW TO WORK MULTIPLICATION EXAMPLES

Harry has 24 stamps on each page of his stamp album. How many stamps has he on 3 pages?

Harry has three times 24 stamps.

Step 1

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$$

See $\times 3$. Think 12. This is 1 ten and 2 ones. Write only the 2 ones of the 12 in the product and carry the 1 ten.

Step 2

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$$

See $\times 3$. Think 6 tens. Add the 1 ten carried to the 6 tens. Think 6 and 1. Write 7. Harry has 72 stamps on 3 pages.

To check: Cover the product and repeat your work.

Tell how each product was found. Find the missing numbers.

a.

$$\begin{array}{r} 70 \\ \times 2 \\ \hline 140 \end{array} \quad \begin{array}{r} 123 \\ \times 3 \\ \hline 369 \end{array} \quad \begin{array}{r} 56 \\ \times 2 \\ \hline 112 \end{array} \quad \begin{array}{r} 18 \\ \times 3 \\ \hline 54 \end{array}$$

b.

$$\begin{array}{r} 47 \\ \times 2 \\ \hline ?4 \end{array} \quad \begin{array}{r} 90 \\ \times 3 \\ \hline ??0 \end{array} \quad \begin{array}{r} 85 \\ \times 2 \\ \hline ??0 \end{array} \quad \begin{array}{r} 403 \\ \times 2 \\ \hline ??6 \end{array}$$

Find these products. Check your work for mistakes.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	50	320	71	84	420	81	90
	3	3	3	2	2	3	2
2.	27	36	85	31	94	16	69
	2	3	2	3	3	2	3

Mixed Practice in Multiplication

3.	58	95	70	47	63	89	214
	3	2	3	2	2	3	2

LET'S PRACTICE

5

Try to work every example on this page correctly.

Set 1 + Addition +

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	12	70	7	95	39	6	9
	74	55	50	6	77	7	6
						3	7
							9
2.	506	250	153	876	309	94	8
	468	699	568	30	4	413	607

Set 2 — Subtraction —

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	68	27	47	103	73	90	96
	23	20	7	70	44	31	87
2.	64	943	705	505	912	107	800
	5	609	280	318	48	9	542

Set 3 × Multiplication ×

Multiply each number in a row by the first number in the row.

		a	*b*	*c*	*d*	*e*	*f*	*g*
1.	2 ×	430	79	50	28	86	91	76
2.	2 ×	37	60	421	95	85	69	87
3.	3 ×	48	90	65	321	79	68	57
4.	3 ×	81	59	46	200	37	87	96

WHY DO WE MULTIPLY?

1. If a loaf of bread costs 18 cents, how much do 3 loaves of bread cost?

ADDITION	MULTIPLICATION
18¢	18¢
18¢	×3
+18¢	54¢
54¢	

Mary found the answer of the problem by adding three 18's. Tom found the answer by multiplying 18¢ by 3. Were their answers the same? By which of these two ways can you work this problem the more quickly?

You can see that multiplication is a short cut way of adding the same number several times.

2. Check to see if the following pairs of examples are worked correctly. Which of the two methods used in these problems made checking them the easier for you?

a.	46	46	*b.*	231	231	*c.*	48
	46	×3		231	×3		+48
	+46	138		+231	693		96
	138			693			

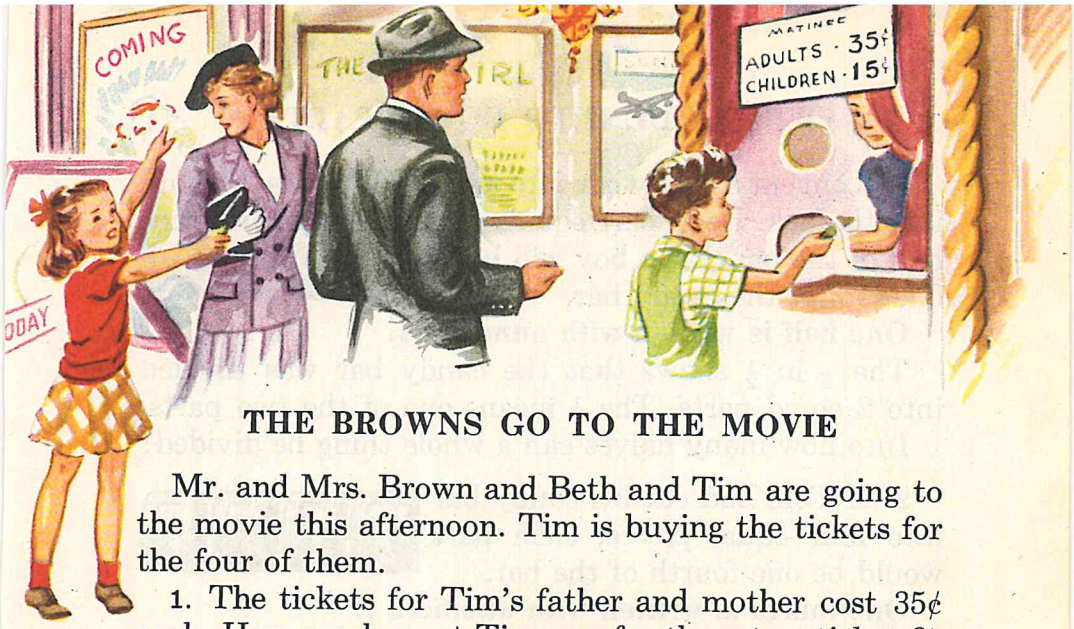
48		
×2		
96		

3. Find the answer of these examples in two ways:

a. 37+37+37 = *b.* 3×50 = *c.* 2×85 =

d. 21+21 *e.* 2×45 *f.* 35+35+35

4. Can the example 49+47+46 be worked using multiplication? Give a reason for your answer.



THE BROWNS GO TO THE MOVIE

Mr. and Mrs. Brown and Beth and Tim are going to the movie this afternoon. Tim is buying the tickets for the four of them.

1. The tickets for Tim's father and mother cost 35¢ each. How much must Tim pay for these two tickets?

2. He must pay 15¢ each for the tickets for Beth and himself. How much will their two tickets cost?

3. How much will Tim pay in all for the four tickets?

4. Tim will pay for the tickets with a dollar bill. Will he get back any change? Explain.

5. The movie will begin at 1:45. It is now 1:35. In how many minutes will the movie begin?

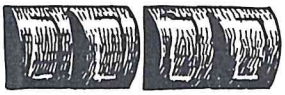
6. At night the tickets for this same movie are 50¢ each for adults, and 25¢ each for children. How much would Tim have to pay for two adults' tickets at night? How much would he have to pay for two children's tickets?

7. How much would Tim have paid for four tickets for the evening movie?

*8. How much did the Brown family save by going to the afternoon movie?

WE DIVIDE INTO EQUAL PARTS

1. Tom cut a candy bar into two equal pieces to share it with Jack. Each part equals one half of the bar. Each boy will have one half of the candy bar.

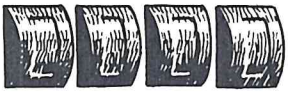


One half is written with numbers $\frac{1}{2}$.

The $\frac{\ }{2}$ in $\frac{1}{2}$ shows that the candy bar was divided into 2 equal parts. The $\frac{1}{\ }$ means one of the two parts.

Into how many halves can a whole thing be divided?

2. If Tom had cut his candy bar into four equal pieces, each part would be one fourth of the bar.



One fourth is written with numbers $\frac{1}{4}$.

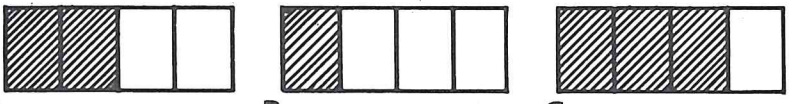
What does the $\frac{\ }{4}$ in $\frac{1}{4}$ mean?

Into how many fourths can a whole thing be divided?

3. The $\frac{1}{\ }$ in $\frac{1}{4}$ means 1 of the four parts. Which of the three pictures below is $\frac{1}{4}$ shaded?

4. **Two fourths is written with numbers $\frac{2}{4}$.** The $\frac{2}{\ }$ in $\frac{2}{4}$ means 2 of the four parts. Which of the three pictures below is $\frac{2}{4}$ shaded?

5. **Three fourths is written with numbers $\frac{3}{4}$.** What does the $\frac{3}{\ }$ in $\frac{3}{4}$ mean? Which of the three pictures below is $\frac{3}{4}$ shaded?



A B C

Numbers such as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$ are called fractions.

OTHER FRACTIONS WE USE

1. Suppose Tom had cut the candy bar into eight equal pieces. Each part would be **one eighth** of the bar.

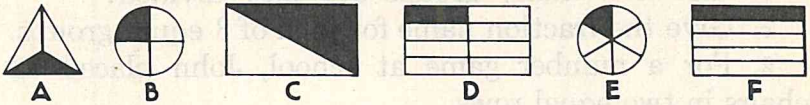
One eighth is written with numbers $\frac{1}{8}$.

What does the $_{8}$ in $\frac{1}{8}$ mean? What does the ^{1} mean? Into how many eighths can a whole thing be divided?

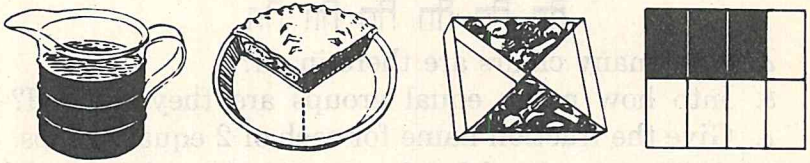
2. Be sure you know the names of these fractions:

$\frac{1}{2}$ is **one half.**	$\frac{1}{3}$ is **one third.**
$\frac{1}{4}$ is **one fourth.**	$\frac{1}{6}$ is **one sixth.**
$\frac{1}{8}$ is **one eighth.**	$\frac{1}{5}$ is **one fifth.**

3. Find the picture that matches each fraction above.



4. Read these fractions: $\frac{2}{4}$; $\frac{3}{4}$; $\frac{2}{3}$; $\frac{3}{8}$. Then match each fraction with the right picture below.



What part of this cup is full?	What part of this pie is gone?	What part of the box is filled?	What part of this paper is colored?

5. Write these fractions with numbers: one eighth; one third; one fifth; one half; one fourth; two fourths; one sixth; three fourths; two thirds.

JOHN DIVIDES CHAIRS INTO GROUPS

1. John's mother is setting the tables for a luncheon for her club. She will serve 12 guests at 3 tables. John placed the 12 chairs at the 3 tables as you see below.

a. How many chairs are there in all?
b. Into how many groups are they divided?
c. Give the fraction name for each of 3 equal groups.

2. For a number game at school, John placed 12 chairs in two equal rows.

a. How many chairs are there in all?
b. Into how many equal groups are they divided?
c. Give the fraction name for each of 2 equal groups.

3.

a. How many chairs do you see in the row above?
b. Into how many equal groups are they divided?
c. Each of 4 equal groups is called $\frac{1}{4}$.
d. How many chairs are $\frac{1}{4}$ of 12 chairs?

DIVISION COMBINATIONS OF TWO AND THREE

Study these combinations and their quotients:

0	1	2	3	4	5	6	7	8	9
$2\overline{)0}$	$2\overline{)2}$	$2\overline{)4}$	$2\overline{)6}$	$2\overline{)8}$	$2\overline{)10}$	$2\overline{)12}$	$2\overline{)14}$	$2\overline{)16}$	$2\overline{)18}$
0	1	2	3	4	5	6	7	8	9
$3\overline{)0}$	$3\overline{)3}$	$3\overline{)6}$	$3\overline{)9}$	$3\overline{)12}$	$3\overline{)15}$	$3\overline{)18}$	$3\overline{)21}$	$3\overline{)24}$	$3\overline{)27}$

What Division Means

Read problem 1, page 34. John took away 4 chairs from the 12 chairs to set one table. He took away 4 more chairs to set another table. He took away the last 4 chairs to set the third table. He took away 4 chairs from the 12 chairs 3 different times.

Dividing is a short way of subtracting when all numbers to be subtracted are the same.

$2\overline{)2}$	$2\overline{)10}$	$2\overline{)4}$	$2\overline{)18}$	$2\overline{)12}$
$2\overline{)6}$	$2\overline{)14}$	$2\overline{)8}$	$2\overline{)0}$	$2\overline{)16}$
$3\overline{)24}$	$3\overline{)6}$	$3\overline{)3}$	$3\overline{)15}$	$3\overline{)0}$
$3\overline{)21}$	$3\overline{)18}$	$3\overline{)9}$	$3\overline{)27}$	$3\overline{)12}$

Make Practice Cards for troublesome combinations.

Other Division Helps

1. Count by 2's from 0 to 18; from 18 back to 0.
2. Count by 3's from 0 to 27; from 27 back to 0.
3. Find $\frac{1}{2}$ of 8; 16; 10; 18; 4; 14; 6; 12; 2.
4. Find $\frac{1}{3}$ of 9; 27; 21; 12; 24; 3; 15; 6; 18.

HOW TO WORK A DIVISION EXAMPLE

If Ned divides his 68 marbles into 2 equal groups, how many marbles will he have in each group?

Step 1 $\begin{array}{r} 3 \\ 2\overline{)68} \end{array}$	See $2\overline{)6}$. This is $2\overline{)6 \text{ tens}}$. Think: 3 tens. Write 3 in the quotient above the 6 tens.
Step 2 $\begin{array}{r} 34 \\ 2\overline{)68} \end{array}$	See $2\overline{)8}$. This is $2\overline{)8 \text{ ones}}$. Think: 4 ones. Write 4 in the quotient above the 8 ones. Ned will have 34 marbles in each group.
To check: Multiply 34 by 2. If the product is the same as the number divided by 2, the work checks.	

To divide $2\overline{)100}$, think: 100 = 10 tens and 0 ones.

To divide $3\overline{)150}$, think: 150 = 15 tens and 0 ones.

To divide $2\overline{)184}$, think: 184 = 18 tens and 4 ones.

	23	41	50	?0	?0?	?0
a.	$3\overline{)69}$	$2\overline{)82}$	$2\overline{)100}$	*b.* $3\overline{)150}$	$2\overline{)804}$	$3\overline{)120}$

Each time 1 hundred was thought of as 10 tens.
Find these quotients. Check your work carefully.

	a	*b*	*c*	*d*	*e*	*f*
1.	$3\overline{)36}$	$2\overline{)40}$	$3\overline{)93}$	$2\overline{)68}$	$2\overline{)20}$	$3\overline{)60}$
2.	$3\overline{)906}$	$2\overline{)208}$	$2\overline{)200}$	$2\overline{)802}$	$3\overline{)900}$	$3\overline{)300}$
3.	$2\overline{)184}$	$3\overline{)210}$	$2\overline{)160}$	$3\overline{)279}$	$3\overline{)243}$	$2\overline{)140}$

4. To find $\frac{1}{2}$ of a number, divide the number by 2. How do you find $\frac{1}{3}$ of a number?

5. Find $\frac{1}{2}$ of 24; $\frac{1}{2}$ of 100; $\frac{1}{3}$ of 15; $\frac{1}{3}$ of 39.

WHY DO WE DIVIDE?

A division problem tells you how many there are in all. It may ask you to divide the amount into smaller parts in several ways. Here are four ways:

1. Mary wishes to write 20 spelling words in 2 equal rows. How many spelling words must she put in each row?

Several things are put into groups that are equal in number. You are asked to find how many things there will be in one of these groups.

2. Mother divided 12 plums equally among 3 boys. How many plums did each boy receive?

Someone divides a number of things equally among a number of people. You are asked to find how much each person receives.

3. Ellen is making prize badges. She has cut a 15-inch ribbon into 3 equal pieces. How many inches long is each piece?

A long piece may be cut into a number of pieces of equal size. You are asked to find how long each piece will be.

4. Peter paid 30 cents for 3 movie tickets. How much did each ticket cost?

You are told the cost of two or more things that are alike in price. You are asked to find the price of one of these things.

5. Make up a problem in division for each of the above four kinds of division problems.

TEDDY'S NEW FOOTBALL

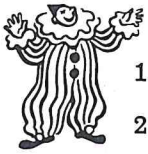
1. The boys who came to Teddy's birthday party put their money together and bought him a fine new football. They paid three dollars and seventy-five cents for it. Write this amount in figures.

2. Twelve boys wanted to play. They chose sides with the same number of players on each of the 2 teams. How many boys were there on each team?

3. The boys found a pole 20 feet long. They cut it into 2 equal pieces to make goal posts. How many feet long would each goal post be?

4. Each side tried to get away with the ball for a touchdown which counts 6 points. Teddy's side made 2 touchdowns. How many points was that? Billy's side made 3 touchdowns. How many points was that?

*5. How is arithmetic used in a real football game?



LET'S PRACTICE

1.	2)60	2)804	2)102	2)168	2)184	2)140
2.	2)68	2)800	3)90	3)603	3)300	2)204
3.	3)243	2)180	3)219	2)164	3)186	2)142
4.	3)210	3)900	3)276	3)240	3)189	3)150

READING HELPS IN DIVISION PROBLEMS

In the picture above, you see children marching by twos in a fire drill at school. How many children are there in all? How many children are there in each group? How many groups of children are marching in the drill?

A Problem about This Picture

In the fire drill 12 children are marching out of the building. If there are 2 children in each group, how many groups are there in the drill?

To find the number of groups, we must separate the 12 children into groups with 2 children in each group.

You can see that to find the number of groups, we must divide 12 by 2 to find how many 2's there are in 12.

X X X X X X
X X X X X X

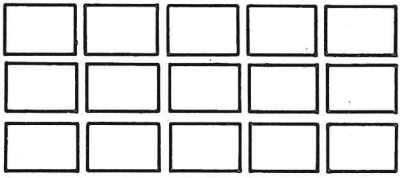
Think: How many 2's in 12?

To work this problem on paper, divide as you see at the right. There are 6 groups.

$$\begin{array}{r} 6 \\ 2\overline{)12} \end{array}$$

DRAWING MAKES READING PROBLEMS EASY

Sarah has 15 postcards to paste in her new album. If she pastes 3 of them on each page, how many pages can she fill?



"It helps me to solve problems if I draw pictures of them," said Nancy. This is the drawing Nancy made for the problem above.

She showed 15 pictures grouped in threes.

She saw that she was dividing the pictures into groups, so she divided 15 by 3, as is shown at the right. She can fill 5 pages.

$$\begin{array}{r} 5 \\ 3\overline{)15} \end{array}$$

You May Draw Pictures of Problems, Too

1. Eight children are playing a game. There are 2 children on each team. How many teams are there?

2. Harry has 12 cents to spend for stamps. At 3 cents each, how many stamps will he get?

3. Mother bought a card of buttons. There were 12 buttons on the card, with 3 buttons in each row. How many rows were there on the card?

4. Helen has 16 pennies. She is going to spend them for valentines that cost 2 cents each. How many valentines can she buy?

5. Sally has 9 picture postcards. If she pastes 3 of them on each page of her postcard album, how many pages can she fill?

WHAT A DIVISION PROBLEM TELLS

1. Tickets for the puppet show are 3 cents apiece. Ed has 15 cents to spend. How many tickets can he buy?

Ed can buy one ticket for each 3 cents which he has. He has 15 cents in all. To find out how many tickets he can buy, you must divide 15 by 3. There are five 3's in 15, so he can buy 5 tickets.

$$\begin{array}{r} 5 \\ 3\overline{)15} \end{array}$$

Division Problem—Type 1

This kind of division problem tells you **how much money you have to spend.** It tells you **the price of one article.** It asks you to find **how many of these articles you can buy.**

a. Mary has 12 cents to spend for candy eggs. At 2 cents each, how many candy eggs will she get?

b. Mary has 12 cents. How many 3-cent candy eggs can she buy with this money?

Division Problem—Type 2

2. Father planted 24 cabbage plants in his garden. He put 3 plants in each row. How many rows of plants were there?

This kind of division problem tells you **how many things there are in all.** It also tells you **how many there are in one group.** It asks you to find **how many groups are formed.**

a. Fifteen children are in a dance. There are 3 children in each group. How many groups are there?

b. In the park 14 children are playing a game. There are 2 children on each team. How many teams are there?

USING YOUR READING HELPS IN PROBLEMS

On this page you will find addition, subtraction, multiplication, and division problems. Tell how you know the process to use in each. Work each problem.

1. At Ben's party the 18 children were grouped into teams of 3 children each to play a game. How many teams of children were there?

2. Roy is 9 years old. His brother is 25 years old. How many years older than Roy is his brother?

3. Howard has collected 40 stamps. How many stamps will he give away if he gives his brother $\frac{1}{2}$ of them?

4. How many 2-cent marbles can Ned buy for 18¢?

5. Alice bought a spelling tablet for 18¢. She gave the clerk 50¢. How much change did she receive?

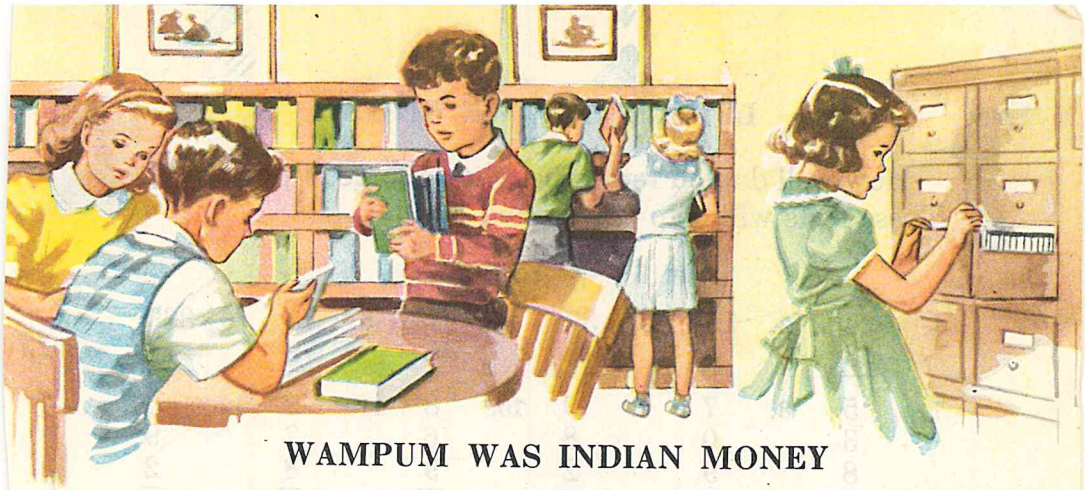
6. Jessie bought a loaf of bread for 9¢, a box of matches for 5¢, and a pound of rice for 8¢. How much did she pay for all?

7. Mother paid 48 cents for 2 dozen oranges. What was the price of these oranges a dozen?

8. Peter placed 14 chairs in each row in the reading circle. How many chairs did he place in 2 rows?

9. Ellen had 24 cents to spend for stamps. At 3 cents each, how many stamps will she get?

10. Virginia's aunt gave her a 50-cent piece for her birthday. She spent 42 cents for a new red leather purse. How much money did she have left?



WAMPUM WAS INDIAN MONEY

In their study of the Indians of long ago, the class learned that the Indians did not have money such as we use today. They used wampum for money. They traded for goods with wampum. Here are some of the children in the library looking up information about wampum.

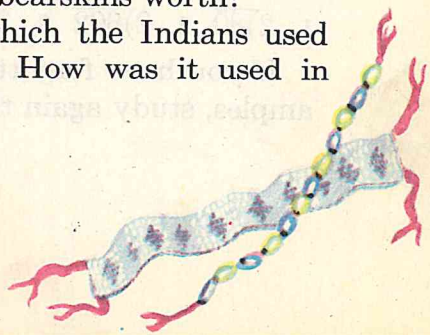
1. There are 6 children on the committee to find the books. If each child can find 3 books about wampum, how many books will the committee bring to the class?

2. Betty found 7 pages about wampum in one book, 9 pages in another, and 4 pages in a third. How many pages in all did she find about wampum?

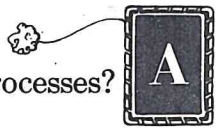
3. An Indian bought 3 deerskins with one strip of wampum. If the Indian bought 12 deerskins, how many strips of wampum did he need to pay for them?

4. A bearskin was worth 2 strips of wampum. How many strips of wampum were 8 bearskins worth?

*5. What was the wampum which the Indians used for money? How was it made? How was it used in trading?



LET'S SEE IF WE KNOW



How well do you remember the arithmetic processes? These tests will help you to find out.

Set 1 + Addition +

1. 24 63	2. 15 4	3. 37 8	4. 87 46	5. 78 79	6. 369 6
7. 5 3 8	8. 7 0 9	9. 9 8 2	10. 8 6 9	11. 9 7 8	12. 6 9 2
13. 638 260	14. 249 705	15. 250 589	16. 169 479	17. 68 775	18. 325 579

Set 2 — Subtraction —

1. 97 46	2. 68 5	3. 59 56	4. 74 45	5. 80 36	6. 75 9
7. 46 37	8. 709 407	9. 895 627	10. 879 695	11. 805 298	12. 756 259
13. 647 578	14. 983 979	15. 864 79	16. 108 69	17. 594 6	18. 604 7

Set 3 × Multiplication ×

1. 60 3	2. 74 2	3. 83 3	4. 79 3	5. 85 2	6. 69 2

Set 4 ÷ Division ÷

1. $2\overline{)80}$ 2. $2\overline{)602}$ 3. $3\overline{)210}$ 4. $2\overline{)184}$ 5. $3\overline{)243}$ 6. $3\overline{)279}$

If you have forgotten how to work any of these examples, study again the self-helps in this chapter.

ACROSS THE BRIDGE TO A NEW CHAPTER

1. Tell the meaning of each word. You may explain its meaning with words, draw a picture to show the meaning, or use objects to picture the meaning.

sum	check	quotient	one eighth
pair	group	addition	multiplication
foot	weight	one half	difference
sale	product	division	one fourth
yard	quarter	remainder	subtraction

2. Which of the following words are used to mean a group of things?

row	each	a	dozen	bunch
apiece	team	pair	one	flock

3. Read these fractions: $\frac{1}{3}$; $\frac{1}{2}$; $\frac{1}{8}$; $\frac{1}{4}$; $\frac{2}{3}$; $\frac{3}{4}$; $\frac{5}{6}$.

4. Write these fractions with numbers:

one eighth	one third	two fifths	two thirds
one fourth	one half	three eighths	two halves

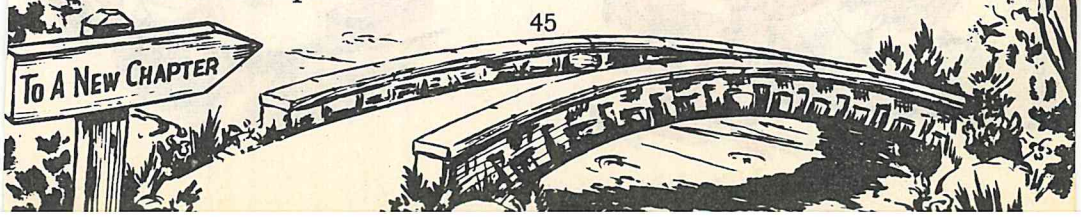
LET'S SEE IF WE KNOW HOW

B

a	*b*	*c*	*d*
49 **(13)**	437 **(13)**	7 **(6)**	875 **(18)**
$\underline{+86}$	$\underline{+558}$	9	$\underline{-786}$
		$\underline{+7}$	

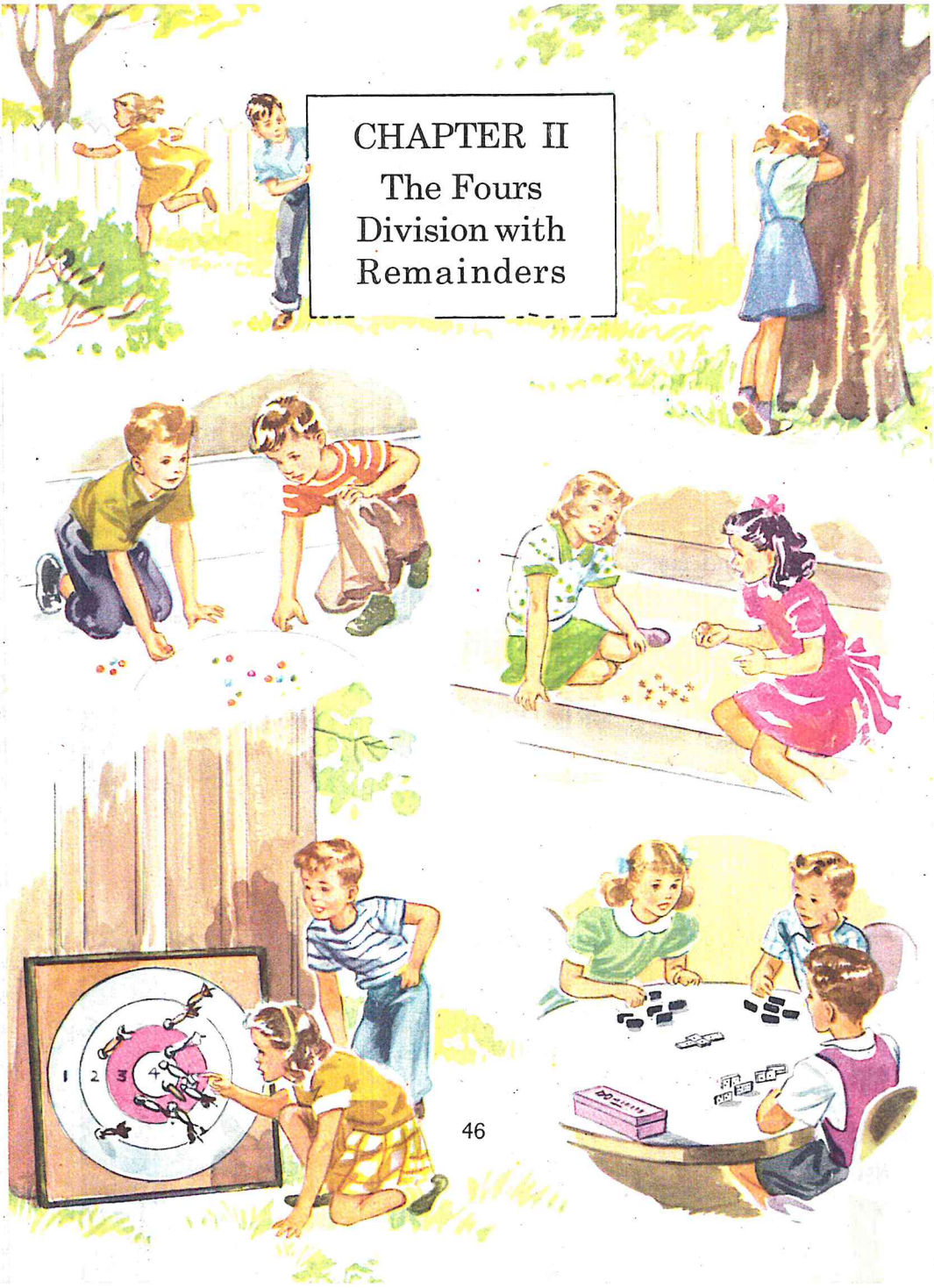
e	*f*	*g*	*h*
80 **(28)**	97 **(25)**	$2\overline{)602}$ **(36)**	$3\overline{)270}$ **(36)**
$\underline{\times 3}$	$\underline{\times 2}$		

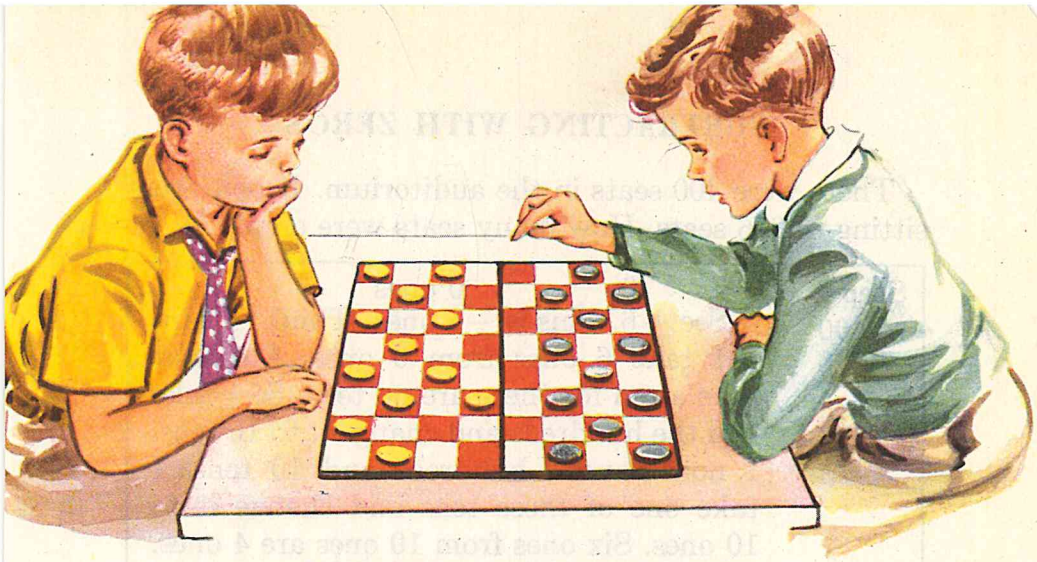
If you have difficulty with any of these examples, turn to the page numbers in heavy type at the right of each example.



CHAPTER II

The Fours Division with Remainders





NUMBERS IN OUR GAMES

1. Study the pictures on the opposite page. Tell how numbers are used in playing each of the games.

2. Bob and Dick earned the money for a game of checkers. The game cost 80 cents. If they shared the cost equally, how much did each boy have to pay?

3. When Bob went to his bank to get his share of the money, he had only 28 cents. How much more money did he need before he could pay his share of the cost?

4. "I will loan you the money," said Dick. So Bob borrowed the money from Dick and promised to pay Dick 3 cents each week. How many weeks will it take Bob to pay back this money to Dick?

5. In a game of checkers there are 12 checkers for each player. How many checkers are there for 2 players?

6. Since they bought their game Bob has won 9 games. Dick has won 14 games. How many more games than Bob has won has Dick won?

SUBTRACTING WITH ZEROS

There were 400 seats in the auditorium. People were sitting in 276 seats. How many seats were empty?

Step 1

$$\begin{array}{r} 400 \\ -276 \\ \hline 4 \end{array}$$

0 0 ones

See -6. This is -6 ones. Think: I cannot take 6 ones from 0 ones. I cannot take a ten for there are no tens. So I take 1 of the hundreds and change it to 10 tens. I now have 3 hundreds and 10 tens. I take one of these tens and change it to 10 ones. Six ones from 10 ones are 4 ones. Write 4. Where?

Step 2

$$\begin{array}{r} 400 \\ -276 \\ \hline 24 \end{array}$$

0 0 tens

See -7. This is -7 tens. Think: When I took one of the hundreds and changed it to 10 tens, and took 1 of the tens, there were 9 tens left. 9 tens − 7 tens = 2 tens. Write 2. Where?

Step 3

$$\begin{array}{r} 400 \\ -276 \\ \hline 124 \end{array}$$

4 4 hundreds

See -2. This is -2 hundreds. Think: I took one of the 4 hundreds, so there are 3 hundreds left. 3 hundreds − 2 hundreds = 1 hundred. Write 1. There were 124 empty seats.

Tell how these remainders were found.

800	307	709	408	900	100
−208	−208	−635	−219	−396	−7
592	99	74	189	504	93

Name the missing numbers.

600	207	700	400	500	100
−514	−29	−65	−338	−187	−93
?6	??8	6?5	?2	??3	?

A SHORT WAY TO SUBTRACT WITH ZEROS

Page 48 explains why 400 is 3 hundreds, 9 tens, and 10 ones. So 500 is 4 hundreds, 9 tens, and 10 ones. Practice this short way of thinking of:

200 700 300 500 900 600 800 400

Set 1 Subtraction

	a	*b*	*c*	*d*	*e*	*f*
1.	300	800	500	400	702	200
	148	407	194	329	259	116
2.	700	401	900	600	905	300
	65	208	873	592	639	81

Set 2 Subtraction

1.	200	406	707	500	906	800
	98	7	489	437	559	25
2.	807	905	600	905	300	700
	518	416	97	387	8	636

Set 3 Subtraction (For those who need more practice)

1.	300	500	704	800	905	100
	242	6	179	693	208	95
2.	800	108	606	904	100	400
	799	9	328	8	94	397

PLANNING FOR HALLOWEEN

Jack, Betty, and Jim are giving a Halloween party. They are telephoning to invite their friends.

1. Jack called and invited 4 boys, Betty called 9 girls, and Jim called 3 boys. How many children will there be in all, counting the three children who are giving the party?

2. It is to be a costume party and prizes will be given for the three best costumes. The children paid 25¢ for each prize. How much did the three prizes cost?

3. They decorated the room with black cats. If each child cuts out 15 cats, how many cats will the three children make in all?

4. "Let us light the room with jack-o'-lanterns," said Jim. If the boys get 16 pumpkins, and each boy fixes $\frac{1}{2}$ of them, how many jack-o'-lanterns will each boy make?

5. Betty paid 60 cents for 3 pounds of little Halloween candies. How much was this a pound?

6. The children helped Mother make the popcorn balls. Each child wrapped 9 balls in colored paper. How many balls did the three children wrap in all?

7. Jack put 800 beans in a glass jar. The children guessed how many beans were in the jar. Find the closest guess: Jim, 680 Janet, 925 Betty, 704

READING HELPS IN PROBLEM SOLVING

Read these multiplication problems, using the problem helps on pages 9 and 30. Where do you find the question in each problem? Is it at the beginning, in the middle, or at the end?

I. Harry bought marble shooters at 3¢ each. **How much did he pay for 8 shooters?**

II. **How much did Harry pay for 8 marble shooters** if the shooters cost 3¢ apiece?

III. Harry bought marble shooters. **How much did he pay for 8 shooters** at 3¢ each?

Copy this chart on your paper. Then study these problems and fill in the chart.

Problem	Number of Marble Shooters Harry Buys	The Price of One Marble Shooter	Cost of All The Shooters
I	8	?	?
II	?	3	?
III	?	?	24¢

1. Are the facts given in each problem the same?
2. Is the answer to each problem the same?
3. Is the question in each problem the same?
4. In solving a problem does it make any difference where the question is placed?

READING TO FIND THE PROBLEM QUESTION

Can you find the question in these two problems?

Problem 1. John earned 10 cents. Harry earned 5 cents. How much did both boys earn together?

Problem 2. John earned 10 cents. Harry earned 5 cents. How much more did John earn than Harry?

a. What two facts are told in the first problem?

b. What two facts are told in the second problem?

c. Are the facts the same in both problems?

d. Now study the questions in these two problems.

In the first problem the question asks you to add the numbers to find the sum.

In the second problem the question asks you to compare the amounts the boys earned.

The most important part of a problem is the question, because the question in the problem decides whether you must add, subtract, multiply, or divide.

It is always a good plan to read the problem through:

1. **to find the question**
2. **to find the facts you must know in order to answer the question**
3. **to decide what process you must use to help you answer the question**

Use the reading helps you have learned on page 9 and above to work the following problems:

1. How many children are there in each row if 20 children are sitting in 4 equal rows?

2. The children are sitting at their desks at school. How many children are there in each row if 20 children are sitting in 4 equal rows?

WHAT PROCESS WILL YOU USE?

1. Tickets for the school play sold at 15¢ each. How much did **Ellen** pay for 2 **tickets?**

a. How many tickets were bought?

b. Who bought the tickets?

c. Read the part of the problem that tells you these two facts.

2. Ellen bought 2 tickets for the school play at 15 cents each. How much did **she** pay for **them?**

To find what the two words **she** and **them** mean in this question, we must go back and **read again** the facts in the problem.

Think: **She** means Ellen.

Them means the two tickets.

Now read the problem again, using the name Ellen instead of **she** and the words **2 tickets** instead of **them.**

Ellen bought 2 tickets for the school play at 15 cents each. How much did Ellen pay for the two tickets?

Now it is easy to see that this is a multiplication problem. Work it. Label the answer as you see in the box at the right.

$$\begin{array}{r} 15¢ \\ \times 2 \\ \hline 30¢ \end{array}$$

Work These Problems

3. Harry sold 7 morning papers at 3 cents each. How much did he receive for them?

4. How many books did Grace put in each pile if she put 10 books in 2 equal piles?

5. Each of 3 girls made 6 pumpkins for a Halloween poster. How many pumpkins did they make in all?

PRACTICING THE PROBLEM HELPS YOU LEARNED ON PAGES 51, 52, AND 53

1. Nick bought 2 balloons at 10 cents each. How much did he pay for them? (Think: What does **them** mean?)

2. How many airplanes have they in all if each of three boys has 4 airplanes? (Think: What does **they** mean?)

3. How much did Sue pay for them if she bought 8 stamps at 3 cents apiece? (Think: What does **them** mean?)

4. Mother gave each of two children 10 pennies. How many pennies did she give them in all?

5. At the picnic the children are playing on 2 teams. How many children are playing in all if there are 25 children on each team? (Think: How many teams does the question mean?)

6. Mother bought 3 loaves of bread at 12 cents a loaf. How much did the bread cost? (Think: How many loaves of bread does this question mean?)

LET'S PRACTICE

1. $\begin{array}{r} 86 \\ +57 \\ \hline \end{array}$ 2. $3\overline{)156}$ 3. $\begin{array}{r} 79 \\ \times 3 \\ \hline \end{array}$ 4. $\begin{array}{r} 847 \\ -390 \\ \hline \end{array}$ 5. $\begin{array}{r} 619 \\ +78 \\ \hline \end{array}$ 6. $\begin{array}{r} 700 \\ -287 \\ \hline \end{array}$

7. $\begin{array}{r} 401 \\ \times 2 \\ \hline \end{array}$ 8. $\begin{array}{r} 468 \\ +489 \\ \hline \end{array}$ 9. $2\overline{)804}$ 10. $\begin{array}{r} 245 \\ +679 \\ \hline \end{array}$ 11. $2\overline{)180}$ 12. $\begin{array}{r} 83 \\ \times 2 \\ \hline \end{array}$

13. $\begin{array}{r} 9 \\ 7 \\ +8 \\ \hline \end{array}$ 14. $\begin{array}{r} 87 \\ -9 \\ \hline \end{array}$ 15. $\begin{array}{r} 4 \\ 9 \\ +5 \\ \hline \end{array}$ 16. $\begin{array}{r} 947 \\ -378 \\ \hline \end{array}$ 17. $\begin{array}{r} 68 \\ \times 3 \\ \hline \end{array}$ 18. $3\overline{)279}$

READINESS TEST FOR DIVISION WITH REMAINDERS

Part I

Divide:

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
1.	$3\overline{)6}$	$2\overline{)6}$	$3\overline{)12}$	$3\overline{)27}$	$2\overline{)16}$	$3\overline{)18}$	$2\overline{)10}$	$2\overline{)12}$	$2\overline{)2}$
2.	$3\overline{)9}$	$3\overline{)24}$	$2\overline{)14}$	$3\overline{)15}$	$2\overline{)8}$	$2\overline{)4}$	$3\overline{)21}$	$2\overline{)18}$	$3\overline{)3}$

Part II

Which is more? Write the part on your paper.

	a	*b*	*c*
1.	2 fours, or 11	3 fives, or 14	3 sevens, or 20
2.	3 fours, or 13	2 sevens, or 15	3 eights, or 26
3.	2 eights, or 15	3 sixes, or 19	2 nines, or 19
4.	2 sixes, or 13	3 nines, or 31	2 fives, or 9

Part III

Subtract the following:

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*
1.	16	18	26	25	35	24	19	29	18	23
	12	18	24	21	32	24	15	28	15	20
2.	20	34	30	22	31	21	23	31	20	21
	18	27	28	16	27	16	18	28	16	18

Part IV

Give the missing numbers:

	a	*b*	*c*
1.	12 + ? = 15	18 + ? = 20	Eight and ? are 11.
2.	16 + ? = 17	16 + ? = 22	Twelve and ? are 15.
3.	24 + ? = 26	28 + ? = 31	Sixteen and ? are 23.
4.	25 + ? = 29	24 + ? = 30	Eighteen and ? are 21.

Part V

1. Copy on your paper every number below that can be divided evenly by 2 without a remainder:

1 4 5 6 9 12 13 14 16 17 18 19

2. Copy the numbers below that can be divided evenly by 3:

2 3 5 6 8 10 12 13 15 18 21 22 24 26 27

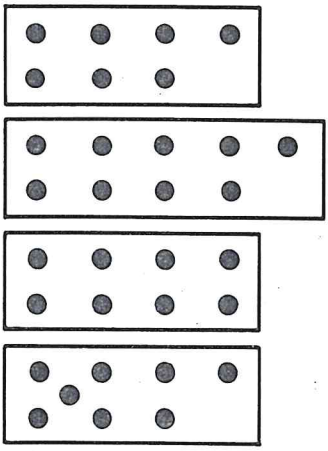
Part VI

1. How many dots more than three twos are there at the right?

2. How many dots more than four twos are there at the right?

3. How many dots more than two threes are there at the right?

4. How many dots more than one five are there at the right?



Part VII

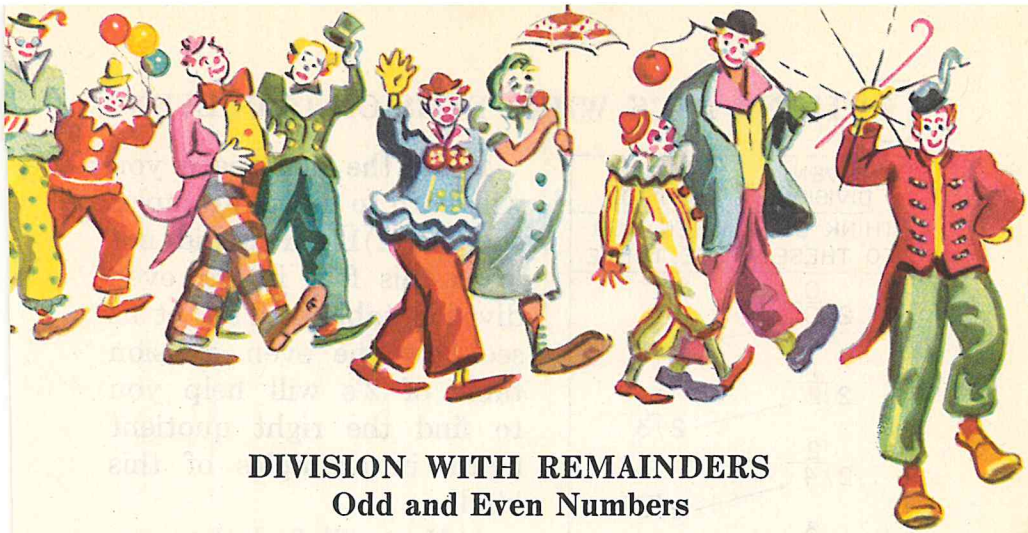
The next smallest number less than 5 that can be divided evenly by 2 is 4.

1. Copy each of the numbers below. Under it write the next smallest number that can be divided by 2.

3 7 11 15 17 19

2. Copy each of the numbers below. Under it write the next smallest number that can be divided by 3.

4 8 11 13 20 25



DIVISION WITH REMAINDERS
Odd and Even Numbers

How many clowns are in the parade? How many groups of 2 are there? One clown has no partner. How many 2's are there in 9? There are 4 twos and 1 left over.

The number left over when you are dividing things into equal groups is called the remainder.

Numbers which can be divided by 2 without a remainder are **even numbers.**	Numbers which have a remainder when divided by 2 are **odd numbers.**
0, 2, 4, 6, 8	1, 3, 5, 7, 9
10, 12, 14, 16, 18	11, 13, 15, 17, 19

Prove, by dividing objects into groups of 2's, which of the numbers above are even numbers and which are odd numbers.

1. Write the even numbers from 0 to 18.
2. Write the odd numbers from 1 to 19.

2 THINK BACK WHEN DIVISION IS UNEVEN

EVEN DIVISION	UNEVEN DIVISION
THINK BACK TO THESE	WHEN YOU SEE THESE
$2\overline{)0}$ = 0	$2\overline{)1}$
$2\overline{)2}$ = 1	$2\overline{)3}$
$2\overline{)4}$ = 2	$2\overline{)5}$
$2\overline{)6}$ = 3	$2\overline{)7}$
$2\overline{)8}$ = 4	$2\overline{)9}$
$2\overline{)10}$ = 5	$2\overline{)11}$
$2\overline{)12}$ = 6	$2\overline{)13}$
$2\overline{)14}$ = 7	$2\overline{)15}$
$2\overline{)16}$ = 8	$2\overline{)17}$
$2\overline{)18}$ = 9	$2\overline{)19}$

1. On the next page you will learn to divide examples such as $2\overline{)17}$. You did not learn this fact in the even division table of 2's. Let us see how the even division table of 2's will help you to find the right quotient figure in examples of this kind.

2. You will find the even division combinations in the left-hand column of the table at the left. Read these combinations in order, giving the quotient for each.

3. Now see the combinations in the right-hand column. You will see that $2\overline{)5}$ comes after $2\overline{)4}$. Therefore you must think back to $2\overline{)4}$ when you see $2\overline{)5}$, because 4 is the largest number less than 5 which contains 2 without a remainder.

4. Use the chart above to help you find the combination to think back to when dividing these numbers by **2**: 11; 3; 9; 17; 13; 5; 19; 7; 1; 15; 9; 17; 7.

5. Now give the answers in **4.** with the chart covered.

DIVISION WITH REMAINDERS

Can Uncle Bob divide 17 pennies equally between 2 children, or will he have some money left over?

$2\overline{)17}$

Divide: Think: 17 ones do not contain 2 without remainder. Think back to 16. Change the 1 ten to 10 ones.

8 ones

$$\begin{array}{r} 8 \\ 2\overline{)17} \end{array}$$

Then think: $2\overline{)16}$ ones. **Write** 8 in the quotient above 7 in ones' place. Why?

Check to see if your quotient is correct.

$$\begin{array}{r} 8 \\ 2\overline{)17} \\ 16 \end{array}$$

Multiply: 2×8. Write 16 below 17.

Compare 16 with 17. You have 17 ones. You use 16 ones. You cannot use **more** ones than you have. If the number you use is too large it shows that the quotient is too large.

$$\begin{array}{r} 8 \text{ r1} \\ 2\overline{)17} \\ 16 \\ \hline 1 \end{array}$$

Subtract 16 from 17 to see how many ones are left.

Compare the remainder, 1, with the divisor, 2. The remainder must always be **smaller** than the divisor. If the remainder is not smaller than the divisor it means that the quotient is too small.

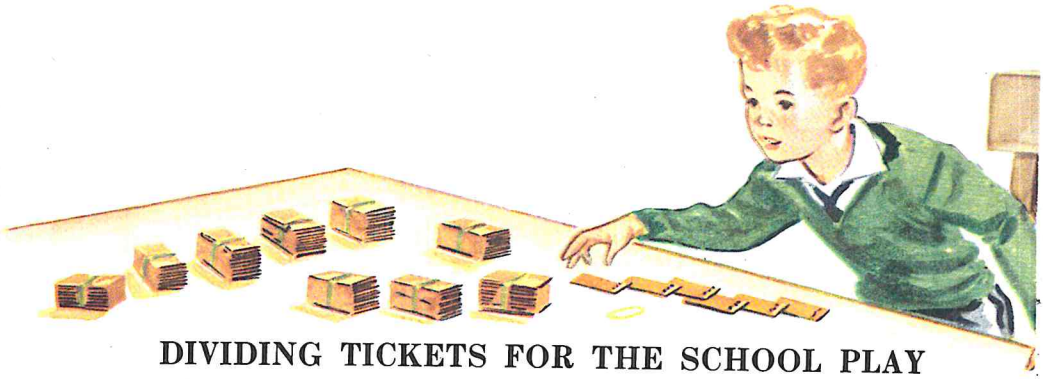
Write the remainder in the quotient like this: **r1.**

Tell how these quotients were found. Name the missing numbers.

$$\begin{array}{r} 7 \text{ r1} \\ 2\overline{)15} \\ 14 \\ \hline 1 \end{array} \qquad \begin{array}{r} 4 \text{ r1} \\ 2\overline{)9} \\ 8 \\ \hline 1 \end{array} \qquad \begin{array}{r} 6 \\ 2\overline{)12} \\ 1? \\ \hline \end{array} \qquad \begin{array}{r} 9 \text{ r1} \\ 2\overline{)19} \\ 18 \\ \hline ? \end{array}$$

Find these quotients:

a	*b*	*c*	*d*	*e*	*f*
$2\overline{)3}$	$2\overline{)11}$	$2\overline{)13}$	$2\overline{)16}$	$2\overline{)5}$	$2\overline{)18}$



DIVIDING TICKETS FOR THE SCHOOL PLAY

Bill is chairman of the ticket committee. He has 96 tickets for the school play which the third- and fourth-grade children are to sell. If he divides the tickets evenly between the two grades, how many tickets will each grade receive?

The tickets are in bundles of ten tickets each, so there are 9 bundles of ten each and 6 extra tickets. This is how Bill divided the tickets:

$$\begin{array}{r} 4 \\ 2\overline{)9} \\ \underline{8} \\ 1 \end{array}$$

First, he divided the bundles of ten. Since there were 9 bundles, each grade received 4 bundles and there was 1 extra bundle of ten tickets remaining.

$$\begin{array}{r} 8 \\ 2\overline{)16} \\ \underline{16} \\ \end{array}$$

Second, Bill opened this extra bundle of 10 tickets. He put these with the 6 extra tickets not in bundles. He had 10 + 6, or 16 tickets to divide. These 16 tickets were divided, so that each grade received 8 tickets more to sell.

Third, Bill gave each grade 4 bundles of 10 tickets and 8 other tickets, or 48 tickets to sell.

Bill's teacher showed him how he could divide 96 by 2 without dividing the actual objects such as tickets. She divided the numbers as you see on page 61.

FINDING A TWO-FIGURE QUOTIENT

Think, 96 is 9 tens and 6 ones.

Step 1

```
  4
2)96
  8
  1
```

Divide the 9 tens by 2. Think: Has 9 a remainder when it is divided by 2? Yes.

Then think back to 8. $\begin{array}{r} 4 \\ 2\overline{)8} \end{array}$ Then $\begin{array}{r} 4 \\ 2\overline{)9} \\ 8 \\ \hline 1 \end{array}$

Step 2

```
  4
2)96
  8x
  16
```

The 1 remaining is 1 ten. Change the 1 ten to 10 ones so they may be divided as ones. Bring down the 6 ones in 96 and write it after the 1 ten to make 16 ones. The x mark under the 6 shows that this number has been brought down.

Step 3

```
  48
2)96
  8x
  16
  16
```

Has 16 a remainder when it is divided by 2? No.

Then divide $\begin{array}{r} 8 \\ 2\overline{)16} \\ 16 \end{array}$

Each grade received 48 tickets.

Tell how these quotients were found. Name the missing numbers.

a.

```
  37      17      18
2)74    3)51    2)36
  6x      3x      2x
  14      21      16
  14      21      16
```

b.

```
  ?4      26      ??      45
3)72    2)52    3)87    2)90
  6x      4x      6x      8x
  12      ??      27      ?0
  12      12      27      ??
```

3 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B
0 3)0	3)1	3)2
1 3)3	3)4	3)5
2 3)6	3)7	3)8
3 3)9	3)10	3)11
4 3)12	3)13	3)14
5 3)15	3)16	3)17
6 3)18	3)19	3)20
7 3)21	3)22	3)23
8 3)24	3)25	3)26
9 3)27	3)28	3)29

1. When dividing examples such as 3)75, you must think 3)7. You did not learn this fact in the even division table of 3's. But the even division table of 3's will help you to find the right quotient figure.

2. The chart shows you that when you see 3)7, you must think back to 3)6, since 3)7 comes between 3)6 and 3)9. What other division fact comes between 3)6 and 3)9?

3. What number would you think back to if you saw 3)8?

4. Use the chart at the left to help you to find the combination to think back to when dividing these numbers by **3**: 19; 4; 10; 25; 16; 1; 28.

5. Use the chart to find the combination to think back to when dividing these numbers by **3**: 20; 5; 11; 29; 23; 14; 17; 2; 8; 26; 13; 22; 7.

6. Divide the numbers from 1 to 30 by 3 without using the chart.

7. **A Test.** What numbers between 1 and 30 when divided by 3 have a remainder of 1? of 2?

LET'S PRACTICE

8

Set 1

Find these quotients. Look over your work carefully.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	2)54	3)84	3)57	2)92	3)78	2)70	3)45
2.	2)96	2)38	3)81	2)34	2)50	3)51	2)36
3.	3)72	3)48	2)52	3)75	2)58	2)30	3)54

Set 2

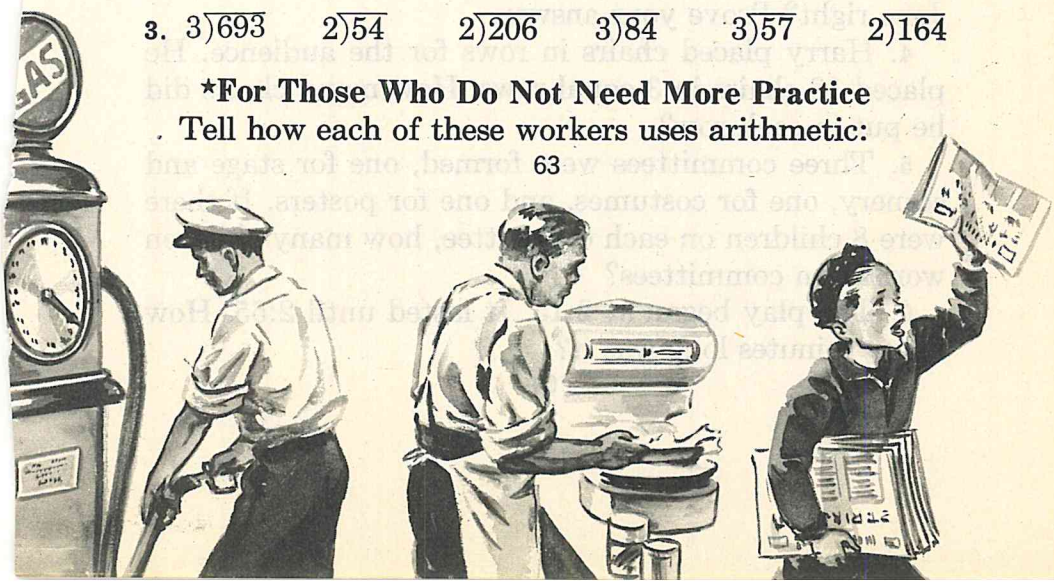
	a	*b*	*c*	*d*	*e*	*f*
1.	3)360	2)56	2)94	3)600	3)42	3)246
2.	2)76	3)39	2)98	3)183	2)78	2)140
3.	2)90	3)900	3)213	2)60	2)120	2)72

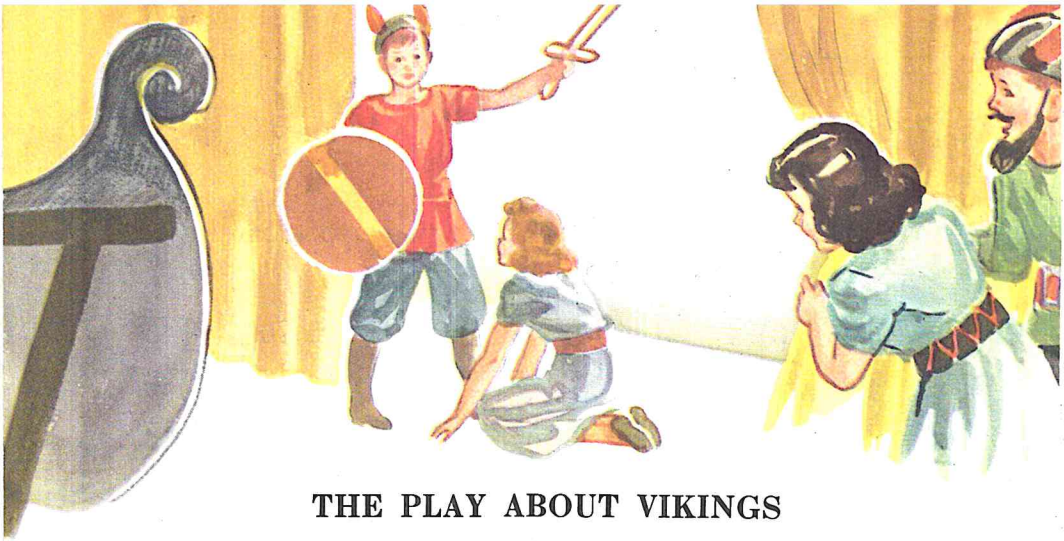
Set 3 (For Those Who Need More Practice)

1.	3)270	3)81	3)142	3)66	2)74	3)930
2.	3)120	2)32	2)28	3)219	2)462	3)87
3.	3)693	2)54	2)206	3)84	3)57	2)164

***For Those Who Do Not Need More Practice**

Tell how each of these workers uses arithmetic:





THE PLAY ABOUT VIKINGS

One day the children decided to write a play about the Vikings.

1. Eight children wrote the first scene, 9 children worked on the second scene, 7 children planned the third scene, and 8 children worked on the fourth scene. How many children in all helped to write the play?

2. Of this number 16 children will act in the play. How many children will be left to be the audience?

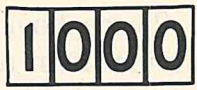
3. "Just half of us are in the play," said Jane. Was Jane right? Prove your answer.

4. Harry placed chairs in rows for the audience. He placed 18 chairs in 3 equal rows. How many chairs did he put in each row?

5. Three committees were formed, one for stage and scenery, one for costumes, and one for posters. If there were 8 children on each committee, how many children worked on committees?

6. The play began at 2:15. It lasted until 2:55. How many minutes long was it?

WHAT THOUSANDS MEAN



Billy was riding in the front seat of the new automobile with his father.

"Oh, look, Father," cried Billy. "The speedometer just turned to four numbers."

Billy knew the meaning of the three-place number, 100. He knew it was 1 hundred, 0 tens, and 0 ones. He knew that a 0 in ones' place and a 0 in tens' place put the 1 in hundreds' place. But he saw that the number on the speedometer was a four-place number.

"That 1 in fourth place means 1 thousand," said Father. "The fourth place in a number, counting to the left, is thousands' place."

"I see," said Billy. "It takes 3 zeros to hold ones', tens', and hundreds' places to put 1 in the fourth place. Then a 1 in thousands' place means as many as 10 hundreds. You see, Father, a 1 in ones' place means just 1. A 1 in tens' place means 10 ones. A 1 in hundreds' place means 10 tens. Each figure in the number 1,111 is as many as 10 of its right hand neighbor."

Show with the number 1,111 that Billy was right.

1. How many thousands do each of these figures show? 2,000; 4,000; 5,000; 7,000; 8,000; 9,000.

2. Here are some of the numbers Billy learned to read on the speedometer. Learn to read them correctly.

1,001 is **one thousand one**. It means 1 more than 1,000. Read and explain: 1,002; 1,004; 1,006; 1,009.

1,010 is **one thousand ten**. It means 10 more than 1,000. Read and explain: 1,020; 1,040; 1,065; 1,096.

1,100 is **one thousand one hundred**. It means 100 more than 1,000. Explain: 1,200; 1,400; 1,607; 1,984.

TWO-FIGURE QUOTIENTS WITH REMAINDERS

Three boys found 76 marbles in the attic. "Let us divide them among ourselves equally," they said. How many marbles can each boy have? How many marbles will be left over?

Think, "76 is 7 tens and 6 ones."

```
  2
3)76
  6
  1
```

Step 1: Divide the 7 tens by 3. Because we are dividing the **tens** by 3, the 1 in the remainder is **1 ten** remaining.

```
  2
3)7
  6
  1
```

```
  2
3)76
  6x
  16
```

Step 2: Change the 1 ten to 10 ones and add it to the 6 ones. This is 16 ones. Show this by **bringing down the 6** to make 16.

```
  25 r1
3)76
  6x
  16
  15
   1
```

Step 3: Divide the 16 ones by 3. There is a remainder of 1.

Write the remainder in the quotient, like this: **r1**. Each of these boys can have 25 marbles. There will be 1 marble left over.

```
  5
3)16
  15
   1
```

```
  25
 ×3
  75
   1
  76
```

To check: Multiply the quotient, 25, by the divisor, 3. This gives 75. Add the remainder, 1, to 75. This gives 76, and the work checks. Tell why.

FINDING QUOTIENTS WITH REMAINDERS

Tell how these quotients were found. Name the missing numbers.

a. 39 r1	15 r2	26 r1	1? r2	*b.* ?? r1	18 r1	2? r?
2)79	3)47	2)53	3)56	3)82	2)37	3)74
6^x	3^x	4^x	3^x	6^x	$?^x$	6^x
19	17	13	26	22	17	14
18	15	12	??	21	16	??
1	2	1	2	1	1	2

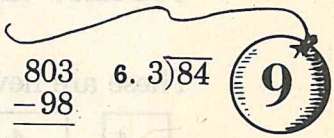
Set 1. Find these quotients. Check your work.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	2)57	3)44	2)39	2)77	3)89	2)51	3)71
2.	3)49	3)52	2)95	3)76	3)55	2)93	3)86

Set 2. In these examples there are no remainders. Write only the quotients.

	a	*b*	*c*	*d*	*e*	*f*
1.	2)124	3)246	3)129	2)40	3)903	3)273
2.	2)260	3)93	3)180	2)102	3)216	3)390

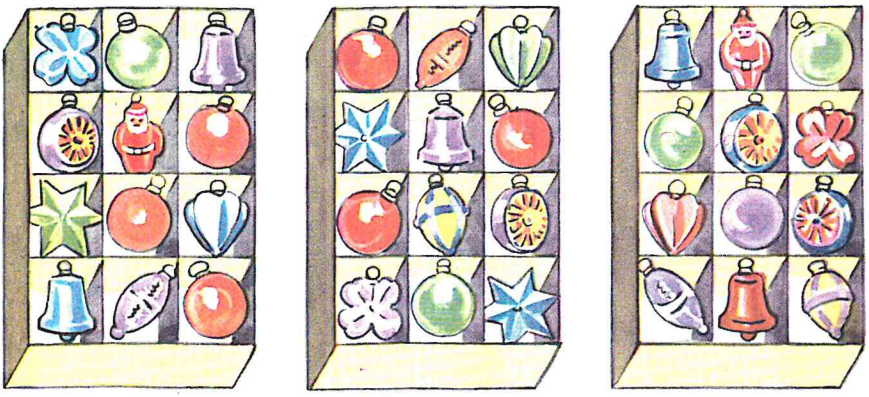
LET'S PRACTICE



1. $\begin{array}{r} 79 \\ +69 \\ \hline \end{array}$ 2. $\begin{array}{r} 600 \\ -538 \\ \hline \end{array}$ 3. $\begin{array}{r} 59 \\ \times 3 \\ \hline \end{array}$ 4. $\begin{array}{r} 279 \\ +475 \\ \hline \end{array}$ 5. $\begin{array}{r} 803 \\ -98 \\ \hline \end{array}$ 6. 3)84

7. $\begin{array}{r} 93 \\ \times 2 \\ \hline \end{array}$ 8. 2)73 9. $\begin{array}{r} 8 \\ 8 \\ +9 \\ \hline \end{array}$ 10. $\begin{array}{r} 708 \\ -209 \\ \hline \end{array}$ 11. $\begin{array}{r} 200 \\ \times 3 \\ \hline \end{array}$ 12. 3)180

MULTIPLYING 4 BY A NUMBER



The children bought these three boxes of Christmas tree ornaments for their classroom Christmas tree. How many ornaments did they buy in all? How many ornaments are there in 1 row from top to bottom?

Find by **adding,** the number of ornaments the children will have put on the tree when they have used:

4 rows 5 rows 6 rows 7 rows 8 rows 9 rows

To find these answers by **multiplying,** you must learn the multiplication combinations of 4's.

You know these:

$$\begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array} \qquad \begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array}$$

These are new products to learn:

$$\begin{array}{r} 4 \\ \times 1 \\ \hline 4 \end{array} \quad \begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array} \quad \begin{array}{r} 4 \\ \times 5 \\ \hline 20 \end{array} \quad \begin{array}{r} 4 \\ \times 6 \\ \hline 24 \end{array} \quad \begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array} \quad \begin{array}{r} 4 \\ \times 8 \\ \hline 32 \end{array} \quad \begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array}$$

PRACTICING WITH 4's

Read these numbers:

0 4 8 12 16 20 24 28 32 36

Without looking at the row of numbers above, count by 4's from 0 to 36; from 36 back to 0.

I. Products to Name

4	4	4	4	4	4	4	4	4
3	6	1	9	2	8	4	7	5
4	4	4	4	4	4	4	4	4
9	4	8	3	7	1	5	2	6

Make a Practice card for each combination you need to study.

II. Products to Find and Check

Find these products. Check each example.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	97	34	85	34	42	60	43
	×3	×9	×3	×4	×8	×3	×7
2.	41	24	34	32	24	34	94
	×3	×4	×6	×3	×5	×1	×2

III. Wrapping Christmas Packages

1. Helen pasted 4 Christmas seals on each package. How many seals did she need for 6 Christmas packages?

2. The children wrapped 4 packages in red paper, 8 packages in holly paper, and 3 packages in green paper. How many packages did they wrap in all?

3. At 4 cents a yard, how much must Helen pay for 9 yards of ribbon for wrapping her packages?

MULTIPLYING BY FOUR

At the Santa Toy Shop

Find by adding, how much you must pay for:

4 one-cent marbles — 4 seven-cent dishes
4 five-cent balloons — 4 eight-cent dolls
4 six-cent masks — 4 nine-cent boats

Find by multiplying, how much you must pay for:

4 two-cent balls — 4 three-cent tops
4 four-cent whistles

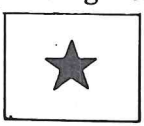
To find these answers the shorter way, you must learn the products of 4's.

You know the reverses. Reverses always have equal products.

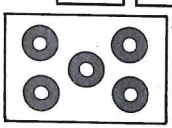
*Why is no reverse for 4×4 given?

Reverses — Reverses

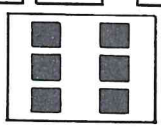
$$\begin{array}{r} 2 \\ \times 4 \\ \hline 8 \end{array} \quad \begin{array}{r} 4 \\ \times 2 \\ \hline 8 \end{array} \quad \begin{array}{r} 3 \\ \times 4 \\ \hline 12 \end{array} \quad \begin{array}{r} 4 \\ \times 3 \\ \hline 12 \end{array} \quad \begin{array}{r} 4 \\ \times 4 \\ \hline 16 \end{array}$$



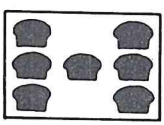
Picture 1



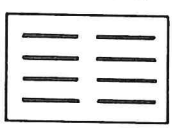
Picture 2



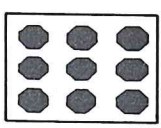
Picture 3



Picture 4



Picture 5



Picture 6

Make 4 pictures like Picture 1. What is the total number of objects in the 4 pictures? 4 ones are?

Do the same for each of the above six pictures. From the pictures, tell how much each of these equals:

4 fives; 4 sixes; 4 sevens; 4 eights; 4 nines.

These are new products to learn:

0	1	5	6	7	8	9
×4	×4	×4	×4	×4	×4	×4
0	4	20	24	28	32	36

Give these products:

6	2	4	7	9	5	4	3	0	4
4	4	5	4	4	4	1	4	4	8
4	1	4	8	4	2	5	4	9	0
3	4	4	4	7	4	4	2	4	4
	1	3	8	4	7	4	4	6	
	4	4	4	6	4	9	4	4	

Make a Practice card for each combination you need to study.

THE READING LESSON

1. These children had 25 questions in a reading lesson. Each question answered correctly counted 4. The number of questions each child answered correctly is shown on this blackboard. Find each child's reading score.

Jerry	24	Mike	17	Helen	16
Allen	18	Hazel	20	Carol	21
Ruth	25	Harold	23	Lucile	19
James	14	Alice	15	Dick	22

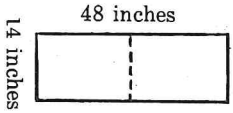
2. How much less than 100 did each child get?

3. How many questions less than Ruth answered did Allen answer?

4. How many questions more than Lucile answered did Jerry answer?

JANE LEARNS TO SEW

1. Jane has a new doll bed. She is sewing a pair of sheets for it. Her mother gave her a 14-inch by 48-inch piece of white cloth. They cut it **in half** like this:



How many inches wide is each sheet? How many inches **long** will each sheet be before Jane hems it?

2. Jane likes to sew. All her dolls together had 18 dresses. Jane has sewed 4 new dresses for them. How many dresses do the dolls now have?

3. Jane has joined the Thimble Sewing Club at school. In it there are 8 girls from the third grade and 9 girls from the fourth grade. How many girls have joined the club?

4. The club meets from 3:15 until 3:45 every Tuesday. How many minutes does the club meeting last?

5. The girls would like to have 25 members in their club. If they already have 17 members, how many more members do they need?

LET'S PRACTICE

10

Set 1 + Addition +

	a	b	c	d	e	f	g
1.	20	82	60	9	66	4	8
	36	57	4	98	79	6	8
						3	6
							8
2.	509	798	459	237	509	86	8
	382	450	183	99	9	123	803

Set 2 — Subtraction —

	a	b	c	d	e	f	g
1.	98	68	81	102	95	60	44
	52	60	1	40	19	35	36
2.	31	852	700	903	226	705	800
	9	409	680	797	58	7	653

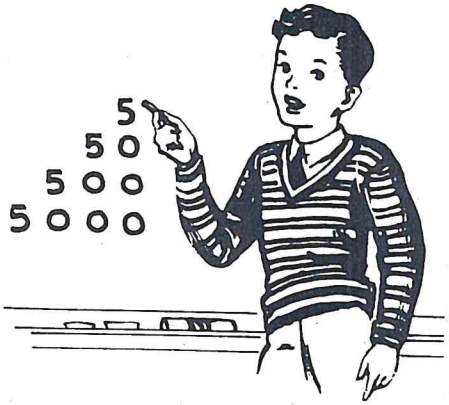
Set 3 × Multiplication ×

	a	b	c	d	e	f	g
1. 3 ×	80	56	91	35	74	82	97
2. 4 ×	85	120	67	29	48	39	76

Set 4 ÷ Division ÷

	a	b	c	d	e	f
1.	$2\overline{)48}$	$2\overline{)602}$	$2\overline{)120}$	$2\overline{)17}$	$2\overline{)54}$	$2\overline{)79}$
2.	$3\overline{)90}$	$3\overline{)600}$	$3\overline{)123}$	$3\overline{)20}$	$3\overline{)87}$	$3\overline{)55}$

NEW PLACES MAKE NEW NAMES FOR FIGURES



"I know how I can tell what to call each figure," said Jerry. "It depends on where the figure is in the number." Jerry wrote these numbers on the board:

"Now watch how the name of the number changes when you move the figure 5 to a new place," said Jerry.

When the 5 is the first right-hand figure, it is in the **ones' place.** It is called five.

When the 5 is the second figure from the right, it is in the **tens' place.** It is called fifty.

When the 5 is the third figure from the right, it is in the **hundreds' place.** It is called five hundred.

When the 5 is the fourth figure from the right, it is in the **thousands' place.** It is called five thousand.

Show that Jerry was right by naming these columns of numbers correctly from top to bottom:

2	7	80	300	4000
20	70	800	3	40
200	700	8	3000	4
2000	7000	8000	30	400

Why may we call zero a **place holder?** What places do zeros hold in the numbers below?

4,300; 8,070; 2,407; 9,006; 6,000; 3,014

FIVE LARGE NUMBERS TO STUDY

Study carefully these five numbers. You are told how to read them and what they mean.

Thousands	Hundreds	Tens	Ones	
8,	6	0	0	This is eight thousand, six hundred. It means 8 thousands, 6 hundreds, no tens, no ones.
2,	7	5	0	This is two thousand, seven hundred fifty. It means 2 thousands, 7 hundreds, 5 tens, no ones.
3,	9	0	4	This is three thousand, nine hundred four. It means 3 thousands, 9 hundreds, no tens, 4 ones.
5,	0	6	8	This is five thousand, sixty-eight. It means 5 thousands, no hundreds, 6 tens, 8 ones.
9,	0	0	5	This is nine thousand five. It means 9 thousands, no hundreds, no tens, 5 ones.

Practice reading these numbers until you make no mistakes. Tell what each number means.

4,329	2,750	8,600	3,904	5,068
7,012	4,080	9,005	6,000	7,003

COUNTING, READING, AND WRITING NUMBERS

Practice in Counting:

1. Count and write the numbers from 1,001 to 1,009.
2. Count and write the numbers from 1,010 to 1,020.
3. Count and write by tens from 1,010 to 1,090.
4. Count and write by hundreds from 1,100 to 1,900.
5. Count and write by thousands from 1,000 to 9,000.

Practice in Reading and Writing: Read these numbers. Then write them as your teacher reads them.

1. 7,000	7. 209	13. 307	19. 6,015	25. 9,017
2. 2,008	8. 8,010	14. 3,607	20. 960	26. 502
3. 4,060	9. 5,027	15. 8,130	21. 1,001	27. 7,305
4. 3,900	10. 710	16. 704	22. 1,011	28. 8,004
5. 493	11. 1,013	17. 2,754	23. 5,000	29. 1,015
6. 6,851	12. 9,103	18. 4,090	24. 700	30. 270

*Magic Squares

A **magic square** is a square in which numbers are placed so that the sum of the numbers in each row, in each column, and in both diagonal rows, is the same. Ancient peoples thought there was magic in these number squares. So they called them magic squares.

The smallest magic square possible is shown here. A **diagonal** of a square connects **opposite corners.** The numbers along one diagonal are 4, 5, 6. What are the numbers along the other diagonal?

8	1	6
3	5	7
4	9	2

What is the sum of the numbers in each row? in each column? in each diagonal? Why is this a magic square?

FOR THOSE WHO NEED MORE PRACTICE

Study again the helps on pages 75 and 76. Then read these numbers.

402	800	630	17	9	635
5,402	2,800	8,630	7,017	3,009	3,635

Write these numbers as your teacher reads them to you.

1. 9,012	4. 3,014	7. 5,607	10. 8,037	13. 5,217
2. 4,730	5. 7,080	8. 7,013	11. 4,800	14. 8,016
3. 1,008	6. 2,017	9. 1,700	12. 3,003	15. 9,482

*For Those Who Do Not Need More Practice

Which of the words below may be used to tell an exact number and always mean the same number? Which words give only an **idea** of the number and do not always mean the same? On your paper write the words in two lists.

one	an	none	many	five	fifty	hundred
few	row	herd	both	some	crowd	several
all	a	pair	each	bunch	apiece	thousand

LET'S PRACTICE

11

1. $\begin{array}{r} 900 \\ -86 \\ \hline \end{array}$ 2. $\begin{array}{r} 98 \\ \times 4 \\ \hline \end{array}$ 3. $2\overline{)72}$ 4. $\begin{array}{r} 157 \\ +649 \\ \hline \end{array}$ 5. $3\overline{)210}$ 6. $\begin{array}{r} 102 \\ \times 4 \\ \hline \end{array}$

7. $\begin{array}{r} 7 \\ 6 \\ +9 \\ \hline \end{array}$ 8. $\begin{array}{r} 704 \\ -5 \\ \hline \end{array}$ 9. $\begin{array}{r} 70 \\ \times 4 \\ \hline \end{array}$ 10. $3\overline{)74}$ 11. $\begin{array}{r} 980 \\ -784 \\ \hline \end{array}$ 12. $\begin{array}{r} 65 \\ +379 \\ \hline \end{array}$

READINESS TEST FOR MORE DIFFICULT MULTIPLICATION

Copy these combinations and write the products:

Part I

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*
1.	1	2	4	7	2	1	9	8	3	0
	2	4	3	2	2	4	3	2	3	2
2.	1	5	3	6	8	3	8	9	0	4
	3	3	4	2	4	2	3	4	3	2
3.	7	7	9	5	2	5	4	6	0	6
	4	3	2	4	3	2	4	3	4	4

Part II

	a	*b*	*c*
1.	$4 \times 9 + 2 =$	$2 \times 7 + 1 =$	$4 \times 6 + 3 =$
2.	$3 \times 8 + 1 =$	$4 \times 8 + 2 =$	$2 \times 9 + 1 =$
3.	$4 \times 7 + 3 =$	$3 \times 9 + 2 =$	$3 \times 7 + 2 =$

Part III

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*
1.	21	32	32	12	41	14	23	25
	3	3	2	4	3	2	4	3
2.	47	16	38	16	46	79	65	95
	2	4	2	3	3	3	2	4
3.	85	78	70	80	60	50	30	50
	3	4	2	3	4	2	4	4

MULTIPLYING WITH CARRYING IN TENS' PLACE

A small airplane flew 132 miles in one hour. At this rate how far would it fly in 4 hours?

Step 1

$$\begin{array}{r} 132 \\ \times 4 \\ \hline 8 \end{array}$$

See $\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$. Think 8 ones. Write 8 in ones' place.

Step 2

$$\begin{array}{r} 132 \\ \times 4 \\ \hline 28 \end{array}$$

See $\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$. Think 12 tens. Twelve tens are 1 hundred and 2 tens. Write 2 tens in tens' place. Carry the 1 hundred to hundreds' place.

Step 3

$$\begin{array}{r} 132 \\ \times 4 \\ \hline 528 \end{array}$$

See $\begin{array}{r} 1 \\ \times 4 \\ \hline \end{array}$. Think 4 hundreds. Add the 1 hundred you carried. Write 5.
It would fly 528 miles in 4 hours.

Explain each example. Find the missing numbers.

a.	260	403	851	*b.* 572	650	710
	$\times 4$	$\times 2$	$\times 4$	$\times 3$	$\times 2$	$\times 4$
	1040	806	3404	1??6	??00	284?

Find these products. Check by doing the work again.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	690	752	391	873	680	541	470
	3	4	4	3	4	3	4
2.	750	820	95	842	951	602	963
	2	3	2	2	4	4	3
3.	43	842	610	752	410	39	871
	2	4	2	3	3	4	4

MULTIPLYING WITH CARRYING IN ONES' PLACE

A faster airplane flew 206 miles in one hour. At this rate how far would it go in 4 hours?

Step 1

$$\begin{array}{r} 206 \\ \times 4 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$$

See $\times 4$. Think 24 ones. The 24 ones are 2 tens and 4 ones. Write 4 in ones' place. **Carry 2 tens.**

Step 2

$$\begin{array}{r} 206 \\ \times 4 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 0 \\ \times 4 \\ \hline \end{array}$$

See $\times 4$. Think 0 tens. Add the 2 tens you carried. 0 tens and 2 tens are 2 tens. Write 2 in the tens' place.

Step 3

$$\begin{array}{r} 206 \\ \times 4 \\ \hline 824 \end{array}$$

$$\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$$

See $\times 4$. Think 8 hundreds. Write 8 in hundreds' place.
It would go 824 miles in 4 hours.

Explain these examples. Find the missing numbers.

a.			*b.*			
418	905	735	603	329	849	705
×4	×4	×2	×4	×3	×2	×4
1672	3620	1470	24?2	??7	16?8	28?0

Find these products. Check by doing the work again.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	823	529	519	706	618	704	405
	4	3	4	4	3	3	4
2.	682	806	95	713	782	309	63
	4	3	2	3	2	4	2
3.	905	471	920	342	79	618	815
	3	4	2	3	4	4	2

MULTIPLYING WITH CARRYING IN ONES' AND TENS' PLACES

A large passenger plane flew 236 miles an hour. At this rate how far would it go in 4 hours?

Step 1

$$\begin{array}{r} 236 \\ \times 4 \\ \hline 4 \end{array}$$

6

See $\times 4$. Think 24 ones. This is 2 tens and 4 ones. Write 4 in ones' place.

Carry 2 tens.

Step 2

$$\begin{array}{r} 236 \\ \times 4 \\ \hline 44 \end{array}$$

3

See $\times 4$. Think 12 tens. Add the 2 tens you carried. 12 and 2 are 14. 14 tens is 1 hundred and 4 tens. Write 4 in tens' place.

Carry the 1 hundred to hundreds' place.

Step 3

$$\begin{array}{r} 236 \\ \times 4 \\ \hline 944 \end{array}$$

2

See $\times 4$. Think 8 hundreds. Add the 1 hundred you carried. Write 9 in hundreds' place.

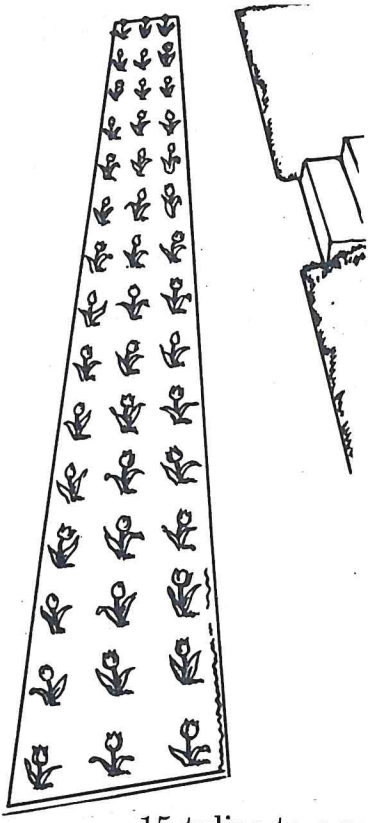
It would go 944 miles in 4 hours.

Explain each example. Find the missing numbers.

a.			*b.*		
658	875	475	926	469	138
$\times 3$	$\times 4$	$\times 2$	$\times 4$	$\times 3$	$\times 4$
1974	3500	950	3??4	1??7	??2

Find these products. Check by doing the work again.

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	865	327	149	635	258	796	879
	4	4	4	3	4	4	3
2.	824	482	805	657	71	390	936
	2	3	4	2	3	2	3
3.	49	627	205	910	134	97	103
	4	4	3	2	4	2	4



FORTY-FIVE TULIPS

The Brown family decided to plant a tulip bed in the narrow strip of ground between the sidewalk and the street. John helped his father plant the tulips.

The picture above shows how they placed the tulip bulbs in rows.

1. Point to the first row of 3 tulips. How many rows of 3 tulips each did they plant?

2. How many tulips did they plant in all?

3 tulips to a row.
They planted $\times 15$

3. Here is an easier way to work this problem:

If you will turn your book sideways you will see that the Browns also planted 3 long rows of 15 tulips each.

15 tulips to a row.
$\times 3$

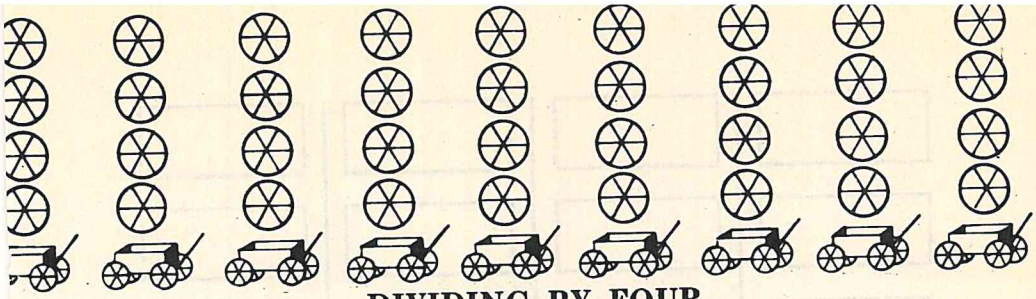
Now you can find the product.

You can see that no matter which way you look at the tulip bed, it does not change the number of tulips in it. Therefore, **reversing** the numbers in a multiplication problem does not change the product.

3 tulips	15
$\times 15$	$\times 3$
45 tulips	45

Find the products:

a. 2	*b.* 4	*c.* 3	*d.* 3	*e.* 4	*f.* 2
$\times 27$	$\times 31$	$\times 18$	$\times 22$	$\times 32$	$\times 65$



DIVIDING BY FOUR

Ted is going to fill small cardboard wagons for his party. He has cut this many cardboard wheels. Count them by 4's. How many has he in all?

How many wagons can he make with 8 wheels? 12 wheels? 16 wheels? 28 wheels? 36 wheels? 20 wheels?

Copy the chart below and fill in the missing numbers.

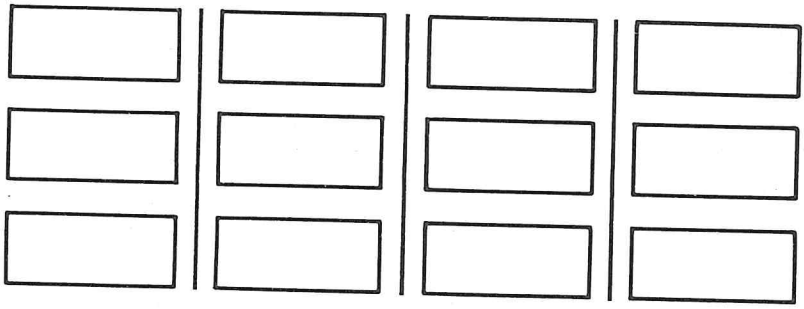
Number of Wheels	Number of Wagons	Division Fact	Number of Wheels	Number of Wagons	Division Fact
8	2	$4\overline{)8}$ = 2	28	7	$4\overline{)28}$ = 7
12	3	$4\overline{)12}$ = 3	32	(?)	$4\overline{)32}$ = 8
16	(?)	$4\overline{)16}$ = 4	36	(?)	$4\overline{)36}$ = 9
20	(?)	$4\overline{)20}$ = 5	4	(?)	$4\overline{)4}$ = 1
24	(?)	$4\overline{)24}$ = 6	0	(?)	$4\overline{)0}$ = 0

Quotients to Name

$4\overline{)16}$ $4\overline{)8}$ $4\overline{)24}$ $4\overline{)12}$ $4\overline{)36}$ $4\overline{)28}$ $4\overline{)32}$

$4\overline{)20}$ $4\overline{)36}$ $4\overline{)28}$ $4\overline{)24}$ $4\overline{)4}$ $4\overline{)32}$ $4\overline{)0}$

Make Practice Cards for troublesome combinations.



FINDING ONE FOURTH OF A NUMBER

Across the top of this page you will see the way Paul arranged 12 papers on the bulletin board. Into how many equal groups of three are the papers divided? How many papers are in each of the four groups?

If a number of things is divided into four equal groups, each of the groups is called one fourth.

Divide any number by 4 if you wish to find $\frac{1}{4}$ of it.

1. Draw pictures of each of the following groups. Then color $\frac{1}{4}$ of each group.

   8 stars 12 stamps 16 cookies

2. Find $\frac{1}{4}$ of 32; 28; 36; 4; 24; 20; 48; 40; 44.

3. Gertrude bought $\frac{1}{4}$ yard of lace for her doll's dress. How many inches of lace did she buy if there are 36 inches in one yard?

4. How much did Gertrude pay for $\frac{1}{4}$ yard of lace if it sold for 20 cents a yard?

5. Mother bought $\frac{1}{4}$ pound of salted nuts that sold for 80 cents a pound. What did they cost?

6. "I am going to save $\frac{1}{4}$ of all the money I earn," said Ted. He has earned 40 cents this week. How much of this money will he save?

4 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B	C
0 4)0	1	2	3
1 4)4	5	6	7
2 4)8	9	10	11
3 4)12	13	14	15
4 4)16	17	18	19
5 4)20	21	22	23
6 4)24	25	26	27
7 4)28	29	30	31
8 4)32	33	34	35
9 4)36	37	38	39

1. In examples like this: 4)96, you must think 4)9. You will not find 4)9 in the even division table of 4's, because it has a remainder. The even division table of 4's will help you to find the right quotient figure.

2. Study the chart at the left. It shows you that when you see 4)9 you must think back to 4)8, since 4)9 comes between 4)8 and 4)12. What other facts come between 4)8 and 4)12?

3. To what combination would you think back if you saw 4)10?

4. When you are dividing examples such as these: 4)74, 4)62, 4)99, you will need to divide the following numbers by 4: 4)7 4)34; 4)6 4)22; 4)9 4)19.

5. The table at the left will help you find the numbers to think back to as you divide each of the following numbers by 4: 15, 26, 31, 37, 3, 2, 11, 18, 21, 35, 5, 39, 30, 27, 13.

6. **To Test:** What numbers between 1 and 40 when divided by 4 have a remainder of 1? of 2? of 3?

LET'S PRACTICE

12

Set 1. In these examples write only the quotients.

	a	*b*	*c*	*d*	*e*	*f*
1.	$3\overline{)90}$	$4\overline{)800}$	$4\overline{)160}$	$4\overline{)84}$	$4\overline{)184}$	$4\overline{)240}$
2.	$4\overline{)328}$	$4\overline{)204}$	$2\overline{)186}$	$3\overline{)903}$	$4\overline{)368}$	$3\overline{)300}$

Set 2. In the following examples show all your work.

	a	*b*	*c*	*d*	*e*	*f*
1.	$4\overline{)52}$	$3\overline{)59}$	$4\overline{)70}$	$2\overline{)98}$	$4\overline{)64}$	$3\overline{)535}$
2.	$2\overline{)55}$	$4\overline{)71}$	$4\overline{)76}$	$3\overline{)85}$	$4\overline{)74}$	$4\overline{)593}$
3.	$3\overline{)73}$	$4\overline{)98}$	$4\overline{)60}$	$4\overline{)65}$	$4\overline{)79}$	$4\overline{)637}$

*For Those Who Need More Practice in Division

Study the steps on pages 58, 59, and 62. Then try these:

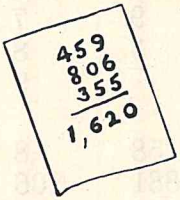
	a	*b*	*c*	*d*	*e*	*f*
1.	$4\overline{)91}$	$4\overline{)57}$	$4\overline{)62}$	$4\overline{)72}$	$4\overline{)55}$	$4\overline{)93}$
2.	$4\overline{)75}$	$3\overline{)51}$	$4\overline{)78}$	$3\overline{)87}$	$4\overline{)67}$	$4\overline{)94}$

*For Those Who Do Not Need More Practice

1. Name things that have the shape of a square; of a circle; of a rectangle; of a triangle.
2. Collect pieces of printed cloth to show how shapes are used in the designs of figured cloth.
3. Collect pictures of buildings to show how these shapes are used in the designs of buildings.
4. Collect samples of wallpaper or linoleum to show that these shapes are found in such designs.

FOUR FIGURES—FOUR WAYS

We may read a four-figure number in different ways when this number is used to mean different things. Let us take the number **1,620.**



1. When **1,620** is an answer to an example, this four-figure number is read **one thousand six hundred twenty.** Read these answers: 2,600; 2,060; 2,006; 2,606; 9,000; 4,727; 4,777; 5,909.

2. When this four-figure number states the cost, it is read **sixteen hundred twenty dollars.**

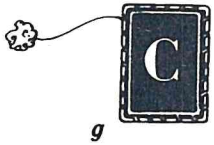
Read these prices: $1420; $1250; $1375.

3. When this four-figure number is used to tell the year, it is read **sixteen twenty.** Read these dates: 1492; 1776; 1942; 1800. Tell the year you were born; the present year.

4. When this four-figure number is used as a telephone number, it is said like this: One-six-two-O (The "0" is said like the letter O). Read these telephone numbers: Grand 1897; Main 196; Gifford 3605; Main 3009; Badger 6090. When we have double zero at the end of a telephone number, like this: 2700, we say, "two seven hundred." Read these telephone numbers:

Main 3600; Grand 4800; Badger 2300.

LET'S SEE IF WE KNOW



Set 1 + Addition +

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	64 12	65 20	90 2	8 59	64 86	5 9 3	9 7 8 9
2.	709 179	190 281	717 889	658 97	819 6	58 881	8 206

Set 2 — Subtraction —

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	56 23	37 37	69 9	101 80	44 29	90 59	58 49
2.	74 7	481 108	309 170	802 507	613 56	702 5	800 796

Set 3 × Multiplication ×

	a	*b*	*c*	*d*	*e*	*f*	*g*
1. 3 ×	60	29	851	704	398	760	435
2. 4 ×	90	15	796	318	420	768	540

Set 4 ÷ Division ÷

	a	*b*	*c*	*d*	*e*	*f*
1.	$4\overline{)80}$	$4\overline{)408}$	$4\overline{)200}$	$4\overline{)38}$	$4\overline{)96}$	$4\overline{)75}$
2.	$4\overline{)168}$	$4\overline{)76}$	$4\overline{)288}$	$3\overline{)58}$	$3\overline{)120}$	$3\overline{)83}$

HELPING MOTHER TO BAKE COOKIES

1. Betsy likes to help Mother cut out star cookies. Each star cookie has 5 points. How many points are there on 4 cookies? on 3 cookies? on 2 cookies?

2. Mother can bake 9 cookies in one cookie tin. How many cookies have they baked when 4 tins are done?

3. Junior wants to help, too. He cut out 8 cookies. Betsy had cut out 28 cookies. How many more cookies had Betsy cut out than Junior cut?

4. Betsy and her mother baked 100 cookies in all that day. If 36 of them were star cookies and the rest were chocolate cookies, how many chocolate cookies were baked?

5. Mother said, "Let us take $\frac{1}{2}$ of each kind to Grandmother." How many star cookies went to grandmother? how many chocolate cookies? how many of both kinds?

6. How many cookies are $\frac{1}{2}$ of 100 cookies?

*7. Bring a cookie recipe to school. Study the kinds of measures needed.

DIVIDING A THREE-PLACE NUMBER WITH A TWO-PLACE QUOTIENT

If Aunt Sarah divides 184 sea shells equally among four of her nieces, how many shells will each girl receive?

We may think of 184 as 1 hundred, 8 tens, and 4 ones. Because 1 hundred is 10 tens, we may think of 184 as 18 tens and 4 ones.

```
   46
4)184
  16
   24
   24
```

Divide. We cannot start by dividing the hundreds, because we cannot divide 1 by 4. Divide the 18 tens by 4. 4)18. Because 18 does not contain 4 without a remainder, we must think back to 16. 4)16.

Write the quotient figure of 4 above the 8. Why? How do we get 16? What numbers do we now compare?

Subtract and compare: How do we get the first 24? the 6 in the quotient? the second 24? There is no remainder.

To check multiply the quotient by the divisor.

```
  46
 ×4
 184
```

Explain these examples. Find the missing numbers.

a.

```
   26      77      .75
4)104   4)308   4)300
   8x      28x     28x
   24      28      20
   24      28      20
```

b.

```
   27 r1     62 r?     6 ? r2
4)109     4)250     3)206
   8x        24x       18x
   29        10        26
   28         8        ??
    ?         ?         ?
```

Divide and check:

	a	*b*	*c*	*d*	*e*	*f*
1.	$4\overline{)108}$	$4\overline{)290}$	$4\overline{)109}$	$4\overline{)140}$	$4\overline{)305}$	$4\overline{)380}$
2.	$4\overline{)224}$	$4\overline{)358}$	$4\overline{)276}$	$4\overline{)315}$	$4\overline{)378}$	$3\overline{)105}$
3.	$4\overline{)198}$	$4\overline{)235}$	$4\overline{)192}$	$4\overline{)252}$	$4\overline{)137}$	$4\overline{)348}$

LET'S PRACTICE

13

1. $\begin{array}{r} 79 \\ +584 \\ \hline \end{array}$ 2. $\begin{array}{r} 908 \\ \times 4 \\ \hline \end{array}$ 3. $4\overline{)304}$ 4. $\begin{array}{r} 400 \\ -3 \\ \hline \end{array}$ 5. $\begin{array}{r} 762 \\ \times 4 \\ \hline \end{array}$ 6. $\begin{array}{r} 768 \\ -39 \\ \hline \end{array}$

7. $\begin{array}{r} 4 \\ 9 \\ +7 \\ \hline \end{array}$ 8. $\begin{array}{r} 740 \\ -696 \\ \hline \end{array}$ 9. $3\overline{)281}$ 10. $\begin{array}{r} 354 \\ \times 4 \\ \hline \end{array}$ 11. $\begin{array}{r} 8 \\ 9 \\ +2 \\ \hline \end{array}$ 12. $4\overline{)70}$

LET'S SEE IF WE KNOW HOW

D

Work these examples one group at a time.

1. $\begin{array}{r} 30 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 89 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 75 \\ \times 4 \\ \hline \end{array}$ **(28)** 2. $\begin{array}{r} 162 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 490 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 871 \\ \times 4 \\ \hline \end{array}$ **(79)**

3. $\begin{array}{r} 615 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 409 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 823 \\ \times 4 \\ \hline \end{array}$ **(80)** 4. $\begin{array}{r} 756 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 349 \\ \times 4 \\ \hline \end{array}$ $\begin{array}{r} 287 \\ \times 4 \\ \hline \end{array}$ **(81)**

5. $3\overline{)69}$ $2\overline{)800}$ $4\overline{)128}$ **(36)** 6. $4\overline{)27}$ $4\overline{)33}$ $4\overline{)22}$ **(59)**

7. $4\overline{)76}$ $4\overline{)56}$ $4\overline{)68}$ **(61)** 8. $4\overline{)95}$ $4\overline{)79}$ $4\overline{)69}$ **(66)**

9. $4\overline{)192}$ $4\overline{)104}$ $4\overline{)315}$ **(90)** 10. $4\overline{)379}$ $4\overline{)350}$ $4\overline{)271}$ **(90)**

If you have difficulty with any examples, turn to the page numbers at the right of the group for help.

DOLLARS AND CENTS

Janice received a dollar bill from her Grandmother. She already had 30 cents. "Now," said Janice, "I have one dollar and thirty cents."

To show how much money Janice had, we write the amount like this: $1.30. The dollar sign is $. We write that first. Then we put a dot called a **decimal point** between dollars and cents. In reading dollars and cents, we call the decimal point, **and.** We read $6.05 like this: six dollars and five cents. It means 6 dollars, no dimes, and 5 pennies.

1. Below are the prices of some toys on sale at less than their regular prices. Read both prices.

Toy	Regular Price	Sale Price
Roller skates	$ 4.95	$3.98
Electric train	$18.50	$14.75
Sled	$7.25	$6.50
Doll carriage	$5.00	$4.05
Doll dishes	$2.85	$1.30

2. Write in figures with $ signs and decimal points:
   a. One dollar and seven cents.
   b. Five dollars and thirty cents.
   c. Eight dollars and thirty-two cents.
   d. Twenty-five dollars and fifteen cents.
   e. Sixteen dollars and eight cents.
   f. Ten dollars and six cents.
   g. Thirty dollars and fifty cents.

*3. Look for advertisements in which articles are priced in dollars and cents. Cut out the advertisements. Bring them to school and read the prices.

MEASURING YOUR GROWTH IN PROBLEM SOLVING II

1. Ben has 6 large rabbits and 8 small rabbits. How many rabbits has he in all?

2. Helen bought 3 postcards for 4 cents each. How much did the postcards cost her?

3. Harry had a quarter. He spent 10 cents for a notebook. How much money did he have left?

4. At a party there were 16 boys and 18 girls. How many children were there at the party?

5. Tom paid 20 cents for 4 pencils. How much did one pencil cost?

6. Arthur has a bicycle. One week he rode 48 miles. The next week he rode 57 miles. How many miles did he ride in the two weeks?

7. In all, 32 children wish to go to a picnic. Four children can ride in each automobile. How many automobiles will be needed to take the children to the picnic?

8. Julia is 61 inches tall. Keith is 58 inches tall. How many inches taller is Julia than Keith?

9. In a library there are 7 tables. There are 4 chairs at each table. How many chairs are there in all?

10. George's father raised 95 chickens. He sold all but 27 of the chickens. How many chickens did he sell?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

LET'S SEE IF WE KNOW HOW

Addition

1. 75 54 6 **(11)**
   64 3 72

2. 37 68 6 **(11)**
   65 7 49

3. 378 459 527 **(13)**
   609 237 358

4. 190 892 682 **(13)**
   886 690 967

5. 569 875 346 **(13)**
   875 489 987

6. 288 353 472 **(13)**
   15 9 9

7. Nine and 3 are? **(5)**
   Seven and 2 are?

8. Thirteen and 4 are? **(5)**
   Fifteen and 2 are?

9. Eighteen and 7 are? **(6)**
   Sixteen and 6 are?
   Thirteen and 7 are?

10. 4 4 6 **(6)**
    5 8 4
    2 6 8

11. 7 7 9 **(6)**
    4 9 8
    9 5 8

12. 5 8 9 **(6)**
    7 4 9
    5 3 9
    3 5 6

Subtraction

1. 79 48 57 **(19)**
   48 6 55

2. 90 62 37 **(19)**
   48 9 28

3. 594 890 876 **(18)**
   325 857 569

4. 959 806 438 **(19)**
   387 396 370

5. 880 967 705 **(18)**
   686 879 646

6. 756 684 505 **(19)**
   87 78 37

7. 404 783 304 **(19)**
   9 8 6

8. 800 200 200 **(48)**
   292 173 9

ACROSS THE BRIDGE TO THE NEW CHAPTER

1. Write the even numbers in the division combinations of 2. Write the odd numbers in another row.

2. Read the following four-figure numbers:

3,576 7,653 5,367 6,735

Tell what the 3 means in each number; the 5; the 7; the 6.

3. Read these dates correctly:

1492 1620 1775 1918 1940

Find three interesting dates and read them to the class. Then tell why each date is interesting.

4. Read these telephone numbers correctly:

Riverside 2300 4030 W Grand 4006

5. Find one fourth of 60 cents; 224 miles; 268 days.

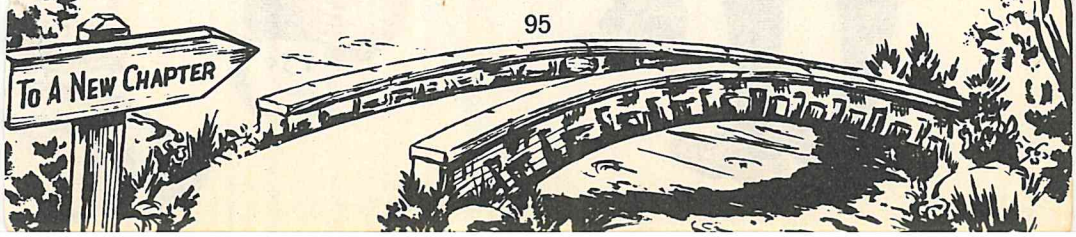
6. Explain the meaning of these words and phrases:

odd numbers	zero	hundred
even numbers	quotient	uneven division
thousand	equal groups	rectangle
speedometer	place value	scores

LET'S PRACTICE

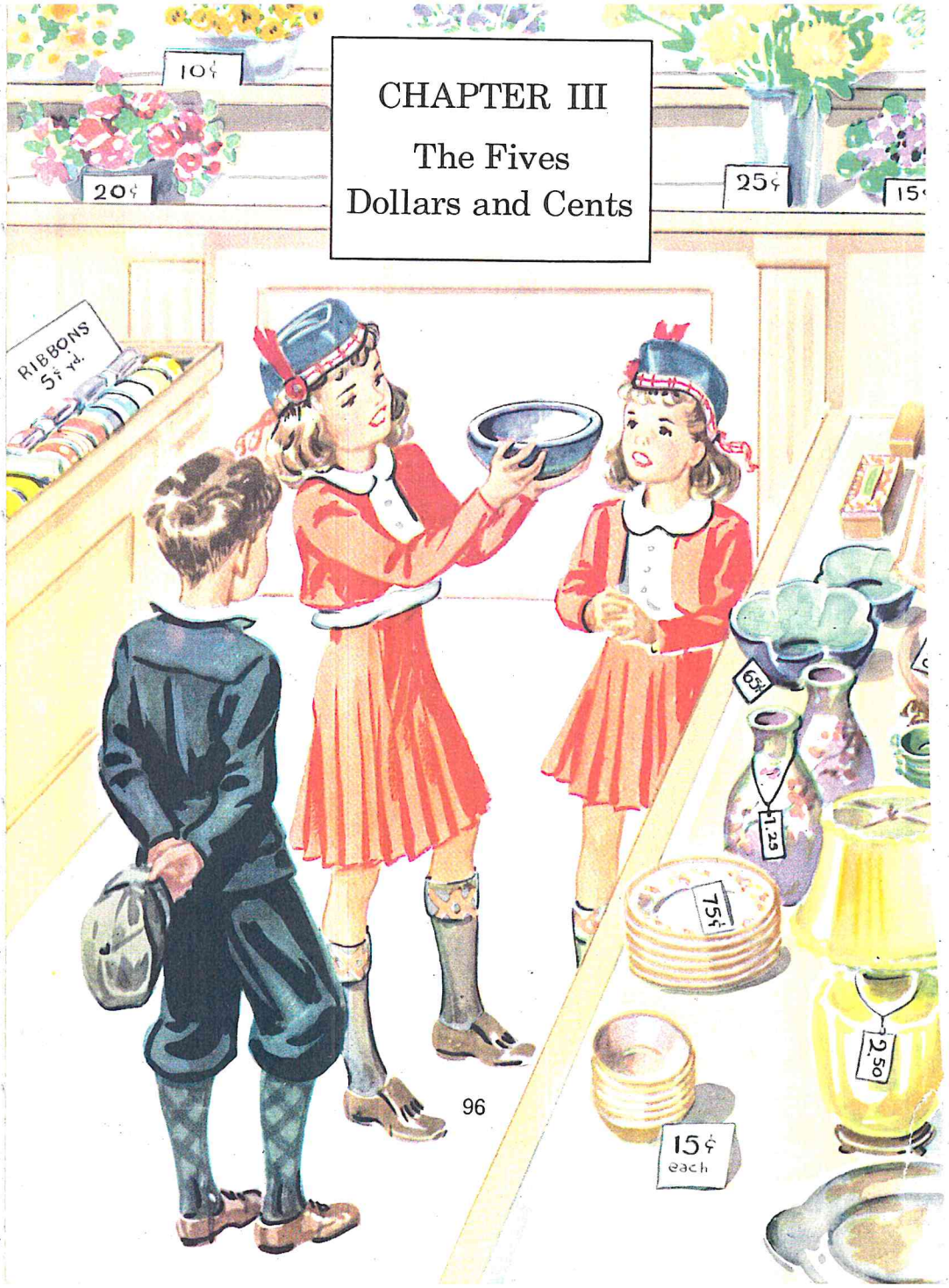
14

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	750 ×2	820 ×3	95 ×2	842 ×2	951 ×4	602 ×4	963 ×3
2.	43 ×2	842 ×4	610 ×2	752 ×3	410 ×3	39 ×4	871 ×4
3.	847 ×4	324 ×8	754 ×3	243 ×9	432 ×7	143 ×6	240 ×5



CHAPTER III

The Fives
Dollars and Cents



A BIRTHDAY GIFT FOR MOTHER

It is Mother's birthday. Father, Patty, Alice, and Larry are choosing a gift for her at the department store.

1. The children bought her a 60-cent flower bowl on sale for 45 cents. How much did they save by buying the gift at the sale price?

2. The present cost the children 45 cents. If they shared the cost equally, how much did each child pay?

3. Father is sending Mother the flowers to put in the flower bowl. He chose sweet peas of four different colors. If he bought 12 of each color, how many sweet peas are there in the bouquet?

4. Patty spent 8 cents for the wrapping paper and 25 cents for the ribbon to wrap the gift. How much did it cost Patty to wrap the gift for Mother?

5. Mother is 45 years old today. How many years older is she than Larry, who is 9? than Alice, who is 7? than Patty, who is 12?

*6. What other things could the children have bought? Make up problems using the prices in the picture.

*7. Find the date of our President's birthday.

DIVIDING WITH ZERO IN TENS' PLACE IN THE QUOTIENT

The children of the Union School march out of the building by fours in their fire drill. There are in all 412 children. How many groups of 4's are there?

412 means 4 hundreds, 1 ten, and 2 ones.

```
   1
4)412
  4x
  1
```

Step 1: Divide the hundreds first. See 4)4. Write 1 in the hundreds' place.

Multiply: 4 × 1 = 4. Write 4. What numbers must you compare?

Subtract. The remainder is 0. Do not write the 0 in the remainder.

Bring down the 1 ten.

```
  10
4)412
  4xx
  12
```

Step 2: Divide the tens next. 4)1. Does 1 contain 4 without a remainder? No. Since you cannot divide, write 0 to hold tens' place.

Change the 1 ten remaining to 10 ones. Bring down the 2 ones.

```
  103
4)412
  4xx
  12
  12
```

Step 3: You now have 12 ones. 4)12. Does 12 contain 4 without a remainder? Yes. Divide 4)12.

Write 3 in the ones' place.

How do we get the lower 12? Compare. There is no remainder.

There will be 103 groups of fours.

To check

```
 103
  ×4
 412
```

PRACTICE IN DIVISION

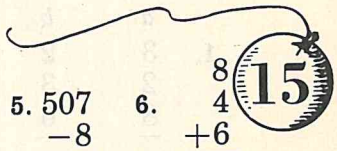
Tell how these quotients were found. Name the missing numbers. For what places is zero a place holder?

a. 208 r2	206 r3	205 r1	*b.* 1?7	2?4 r3	3?? r1
3)626	4)827	4)821	3)321	4)819	2)615
6x x	8x x	8x x	3x x	8x x	6x x
26	27	21	21	19	15
24	24	20	21	16	14
2	3	1		?	?

Divide the following and check:

	a	*b*	*c*	*d*	*e*	*f*
1.	3)318	4)828	3)920	4)834	2)219	4)411
2.	2)217	4)821	4)416	3)912	2)810	4)412
3.	2)218	4)436	3)915	2)413	3)329	4)839
4.	3)624	4)300	2)80	4)427	3)278	4)432

LET'S PRACTICE



1. 9 / 6 / +7
2. 600 / −593
3. 806 / ×4
4. 4)423
5. 507 / −8
6. 8 / 4 / +6
7. 4)192
8. 795 / ×4
9. 939 / +61
10. 340 / −50
11. 341 / ×4
12. 4)67

READINESS TEST FOR MORE DIFFICULT ADDITION

Copy the examples below and find the sums:

Part I

	a	*b*	*c*	*d*	*e*
1.	24 21	32 24	41 53	62 37	33 54
2.	45 36	27 48	59 36	77 19	23 58
3.	65 78	88 86	87 64	95 87	97 76

Part II

	a	*b*	*c*	*d*	*e*
1.	106 485	416 609	926 726	891 752	883 255
2.	499 232	756 287	944 88	37 787	889 323

Part III

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*
1.	3 2 8	2 3 6	6 7 5	4 5 2	8 6 4	7 3 7	8 5 2	5 5 5
2.	7 9 8	8 9 4	7 6 8	9 8 5	7 8 8 8	8 9 7 9	6 9 7 8	6 5 9 9

ADDING A COLUMN OF TWO-PLACE NUMBERS

Three boys want to put their savings together to buy a 75-cent baseball mitt. Joe has 19 cents, Harry has 29 cents, and Paul has 32 cents. How much money have the boys together? Have they enough to buy the mitt?

19¢ 29¢ 32¢ 80¢	Begin at the top and add down. **Step 1:** Think: 18, 20. 20 is 2 tens and 0 ones. Write 0 below the ones. Carry 2 tens. **Step 2:** Add the 2 carried to the 1 at the top of the left-hand, or tens', column. Think: 3, 5, 8. Write 8 under the tens' column. The boys have 80¢. They can buy the mitt.
19¢ 29¢ 32¢ 80¢	**To check:** Add from the bottom up. In checking, carry the number to the left-hand lower figure. First: Think 11, 20. Next: Add the 2 tens that you carried, to the 3 tens at the bottom of the left-hand column. Think: 5, 7, 8. The work checks. Why?

1. Study these sums. Name the missing numbers.

a.	*b.*	*c.*	*d.*	*e.*	*f.*
23	45¢	$.16	94	24	9
41	30¢	.48	8	331	495
15	12¢	.27	37	243	837
79	87¢	$.91	?39	??8	??4?

2. Work the examples below. Check your answers.

a.	*b.*	*c.*	*d.*	*e.*	*f.*
14	16¢	$.13	87	21	8
22	10¢	.76	8	106	529
53	52¢	.10	79	860	996

PRACTICE IN COLUMN ADDITION

	a	*b*	*c*	*d*	*e*	*f*
1.	13	14¢	$.22	59	68	9
	54	43¢	.43	95	9	76
	20	21¢	.14	38	75	88
2.	151	330	289	99	646	717
	203	55	177	189	79	587
	235	611	968	746	895	9

3. Jerry owns 16 books, Peter owns 25, and Ned owns 19. How many books do they own together?

4. Alice saved $.26 one month, $.14 the next month, and $.49 the third month. How much did she save?

The Place Value of Numbers in Column Addition

Jim and Sue both worked example number 2*b* at the top of this page.

330	330
55	55
611	611
996	1491
Jim's Work	**Sue's Work**

Miss Allen said that Jim's work was right, but that Sue's work was wrong. Can you tell why Sue's example is wrong?

In writing numbers in columns to be added, remember:

All ones must be written in the ones' column.
All tens must be written in the tens' column.
All hundreds must be written in the hundreds' column.

Write these numbers in columns and add:

5. 154 + 60 + 6 = ? 6. 5 + 776 + 39 = ?

FINDING SUMS IN COLUMNS

"Now that I understand how to write numbers correctly in columns, I like to find their sums," said Sue. "May we work some more examples like them?"

Miss Allen then wrote these examples on the board for the class to do. Sue had a perfect paper. Can you write them correctly in columns and find the sums?

1. 69 + 22 + 18 =?
2. 58 + 4 + 49 =?
3. 8 + 72 + 38 =?
4. 93 + 64 + 3 =?
5. 69 + 98 + 6 + 77 =?
6. 59 + 7 + 98 + 89 =?
7. 85 + 59 + 78 + 8 =?
8. 365 + 598 + 479 =?
9. 246 + 59 + 337 =?
10. 7 + 479 + 66 =?
11. 129 + 975 + 6 =?
12. 88 + 746 + 5 =?

13. Bill has read three library books about boats. One book was 95 pages long, another 134 pages, and the third 123 pages. How many pages did he read in all?

14. Ronald has 64 stamps, Joe has 351, and Roy has 86. How many stamps have the three boys altogether?

15. How many more stamps has Joe than Ronald? How many more stamps has Joe than Roy?

16. On their vacation trip the Doe family drove 304 miles the first day, 247 miles the second day, and 276 miles the third day. How far did they travel in all?

ADDING DOLLARS AND CENTS

How much must Norman pay if he buys a sled for $6.50 and a pair of skates for $3.25?

$6.50 **3.25** **$9.75**	Study the work at the left to find the answers to these questions about adding dollars and cents.

1. It takes two kinds of money signs to show that you are adding dollars and cents. The decimal point is one kind. What is the other?
2. How many dollar signs are used in working this example? Where are they written?
3. How many decimal points are used? What do you notice about how they are placed?

Talk about these models. Tell how the decimal points in each example help to place the numbers correctly in a column to be added.

$4.26	$ .09	$3.47	$8.89	$3.98	$6.78
.08	5.98	.05	.97	.09	7.68
$4.34	$6.07	$3.52	.07	9.76	8.96
			$9.93	$13.83	$23.42

Add the following and check:

	a	*b*	*c*	*d*	*e*	*f*
1.	$6.00	$4.07	$5.83	$4.77	$ .89	$ .04
	9.00	5.68	.46	.04	3.49	6.98

2.	$6.49	$6.87	$5.39
	3.95	.03	3.89
	9.57	8.38	.57

3. $2.49 + $ .91 + $9.87 =?
4. $9.19 + $7.48 + $ .09 =?
5. $9.87 + $ .09 + $2.69 =?

HALF FARE FOR CHILDREN

Lois and James are taking the train to their grandmother's. On trains, people 12 years and older pay full fare. Children under 12 years pay only half fare. A tax is added to all fares.

1. Half fare plus tax to grandmother's is 45¢. What is the cost of a full fare ticket?

2. How much will two full-fare tickets cost?

3. Lois is 10 years old. How much must her father pay for her ticket?

4. James is 7 years old. How much does his ticket cost? How much do the tickets for the two children cost? How long will it be before James must begin to pay full fare?

5. How much will the two half-fare tickets to their grandmother's home and return cost?

*6. What is meant by "reduced fares"?

READINESS TEST FOR MORE DIFFICULT SUBTRACTION

Copy the examples below and find the remainders.

Part I

	a	*b*	*c*	*d*	*e*
1.	48	96	87	69	97
	31	35	42	40	43
2.	395	285	608	683	600
	265	223	603	200	300

Part II

	a	*b*	*c*	*d*	*e*
1.	71	84	91	90	45
	36	56	82	72	38
2.	437	528	893	846	967
	219	209	568	680	208
3.	835	626	836	535	734
	796	437	149	479	139

Part III

	a	*b*	*c*	*d*	*e*
1.	809	309	509	809	807
	285	217	399	468	743
2.	700	500	900	900	600
	253	265	207	301	597
3.	702	901	605	706	703
	378	449	237	408	694

SUBTRACTING DOLLARS AND CENTS

Howard has $3.98. He wants to buy an erector set for $6.30. How much more money does he need?

$6.30 **3.98** **$2.32**	Be sure that you place the $ sign before the remainder and put a decimal point between dollars and cents.

Study the placing of the money signs in each example.

$6.51	$3.43	$6.63	$2.43	$7.17	$9.50
2.48	.53	5.69	2.37	7.08	8.94
$4.03	$2.90	$ .94	$ .06	$ .09	$ .56

$15.31	$36.48	$57.70	$102.52	$196.80
6.35	29.48	56.90	81.59	196.75
$ 8.96	$ 7.00	$ .80	$ 20.93	$ .05

Remember: When your answer is in **cents only**, and the **remainder** has **only one figure**, write a **zero** before the number. Put a decimal point before these two numbers. Write the dollar sign. Look for examples like this in the two rows of study examples above.

Find these remainders. Watch the money signs!

	a	*b*	*c*	*d*	*e*
1.	$8.32	$4.40	$3.00	$5.68	$6.38
	6.28	.67	1.96	.80	4.59
2.	$2.49	$5.71	$8.75	$1.05	$6.91
	2.47	5.39	8.69	.88	6.87
3.	$10.62	$43.20	$107.42	$35.14	$293.49
	2.93	38.20	19.87	34.58	54.60

PAT'S WINTER CLOTHES

Hello, boys and girls! I am Pat. I am wearing the new winter clothes Mother and I bought. Read the prices:

Leather jacket $6.00
Leather helmet $1.50
Leather mittens $.79
Trousers $1.98
10-inch boots $2.59
Socks 3 pair for $1.00

1. In the coat department of the store Mother and I bought the leather jacket, the leather helmet, and the leather mittens. How much did we spend in all for these things?

2. Mother gave the clerk a $10.00 bill. How much change did she receive?

3. Next we went to the shoe department. I tried on a pair of 12-inch boots for $3.29. I liked the higher boots very much, but decided to save money by buying the shorter pair. How much less than the high boots did the shorter boots cost?

4. In the shoe department boys' socks that sell for 50 cents a pair at the regular price were on sale at 3 pairs for $1.00. How much would 3 pairs of socks have cost at the regular price?

5. How much did we spend in all for the boots and 3 pairs of socks at the sale price?

*6. Find the total amount of money we spent.

PATSY'S NEW BICYCLE

1. Patsy has just bought a new bicycle. It cost twenty-four dollars and ninety-five cents. Write this amount in dollars and cents.

2. She and Father paid for it with twenty-five dollars. How much change did they receive?

3. Patsy earned $6.50 toward her bicycle. Her father gave her the rest of the money. How much money did he give her?

4. Patsy rides 3 miles each day in going to and from school. How many miles does she ride in 20 days?

LET'S PRACTICE

16

Find these products:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1. 4 ×	30	79	26	508	971	634	582
2. 4 ×	418	965	720	416	387	500	349

Find these quotients:

	a	*b*	*c*	*d*	*e*	*f*
1.	$4\overline{)31}$	$4\overline{)64}$	$4\overline{)812}$	$4\overline{)340}$	$4\overline{)98}$	$4\overline{)295}$
2.	$4\overline{)158}$	$4\overline{)424}$	$4\overline{)262}$	$4\overline{)54}$	$4\overline{)430}$	$4\overline{)187}$

LET'S PRACTICE

17

Subtract. How many of these remainders can you find without a mistake?

	a	*b*	*c*	*d*	*e*
1.	$6.52	$3.91	$3.00	$7.62	$9.15
	−5.06	−.58	−2.47	−.23	−.10
2.	$2.52	$13.19	$64.72	$10.37	$26.87
	−2.45	−9.43	−64.64	−6.00	−.49
3.	$101.68	$503.87	$135.96	$758.89	$778.85
	−39.77	−503.78	−.79	−273.95	−573.09

4. Harold has saved $7.05. His brother, Ted, has saved $5.98. How much more has Harold saved than Ted?

5. Jane had $5.45. How much money did she have left after she bought a new red sweater for $3.96?

*For Those Who Need More Practice

If you need more practice in subtraction, your teacher will help you with the steps you do not understand. Then try to do the examples below correctly.

	a	*b*	*c*	*d*	*e*
1.	$9.63	$4.84	$6.00	$7.83	$4.46
	4.04	.18	5.13	.59	.50
2.	$48.41	$94.82	$2.73	$15.20	$24.06
	8.38	19.00	2.68	14.99	6.84
3.	$101.90	$390.73	$208.52	$434.96	$275.23
	70.62	390.17	.29	246.08	199.76

SAVING MONEY

1. Otto saved 55¢ in July, 65¢ in August, and 80¢ in September. How much did he save in the three months?

2. Otto already had $17.90 in his savings bank. How much will he have after he deposits the $2.00 he has been saving?

3. How much less than $20.00 will Otto have?

4. Betty saves 8 cents each week from money she earns helping with the dishes at home. How much can she save in 15 weeks?

LET'S PRACTICE

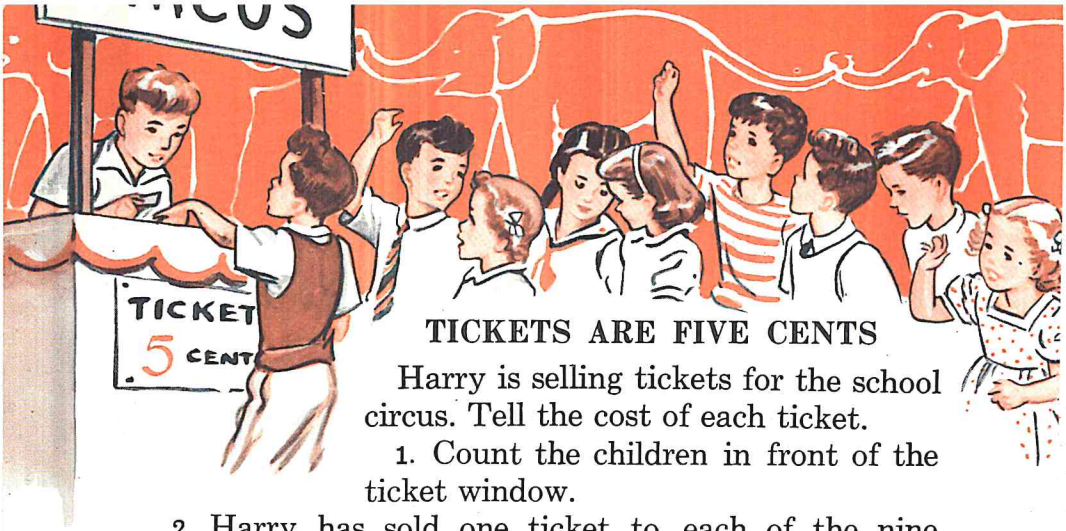
18

× Multiplication ×

	a	*b*	*c*	*d*	*e*	*f*	*g*
1. **3 ×**	70	68	591	326	947	502	835
2. **4 ×**	75	80	916	438	592	273	640

÷ Division ÷

	a	*b*	*c*	*d*	*e*	*f*
1.	$3\overline{)90}$	$4\overline{)804}$	$3\overline{)276}$	$4\overline{)38}$	$4\overline{)60}$	$3\overline{)56}$
2.	$4\overline{)348}$	$3\overline{)230}$	$4\overline{)824}$	$4\overline{)416}$	$3\overline{)917}$	$4\overline{)174}$



TICKETS ARE FIVE CENTS

Harry is selling tickets for the school circus. Tell the cost of each ticket.

1. Count the children in front of the ticket window.

2. Harry has sold one ticket to each of the nine children. How much money has he received?

Harry can count his money by adding like this:

$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 45$, or by counting 5, 10, 15, 20, 25, 30, 35, 40, 45. He has 45¢.

Because Harry knows how to multiply fives, he can find the amount he has in all by multiplying

$$\begin{array}{r} 5¢ \\ \times 9 \\ \hline 45¢ \end{array}$$

Which way is the shortest: counting, adding, or multiplying?

You know these:
Write the reverse and its product for each.

$$\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array} \quad \begin{array}{r} 5 \\ \times 3 \\ \hline 15 \end{array} \quad \begin{array}{r} 5 \\ \times 4 \\ \hline 20 \end{array}$$

These are new. Study and learn them.

$$\begin{array}{r} 5 \\ \times 1 \\ \hline 5 \end{array} \quad \begin{array}{r} 5 \\ \times 5 \\ \hline 25 \end{array} \quad \begin{array}{r} 5 \\ \times 6 \\ \hline 30 \end{array} \quad \begin{array}{r} 5 \\ \times 7 \\ \hline 35 \end{array} \quad \begin{array}{r} 5 \\ \times 8 \\ \hline 40 \end{array} \quad \begin{array}{r} 5 \\ \times 9 \\ \hline 45 \end{array}$$

PRACTICING WITH 5's

I. Products to Name

5	5	5	5	5	5	5	5	5
8	1	2	7	4	6	9	5	3
5	5	5	5	5	5	5	5	5
9	2	6	3	7	5	4	1	8

Make a Practice card for any combination you do not know.

II. Problems to Read and Do

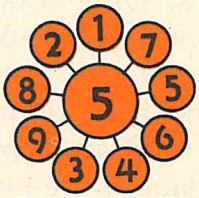
1. What must you pay for 6 five-cent streetcar fares? What change will you get from a half dollar?

2. At 5¢ each, how much must you pay for:

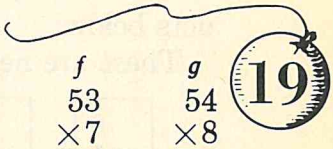
a. 4 ice cream cones? *c.* 7 candy bars?
b. 2 packages of gum? *d.* 9 bags of popcorn?

III. A Merry-go-round Game

Multiply the number in the center of the merry-go-round by each of the numbers in the outside rings. Think: 4 fives; 6 fives; 5 fives; and so on.



LET'S PRACTICE

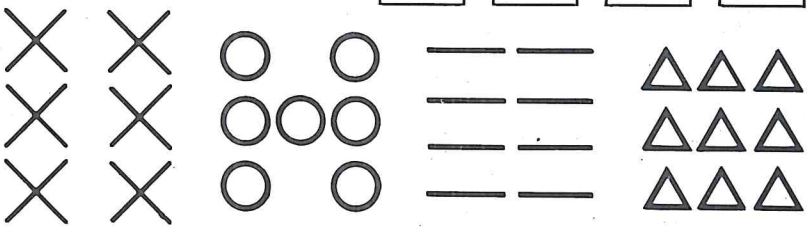


	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	35	45	51	50	25	53	54
	×5	×6	×4	×3	×9	×7	×8
2.	954	245	325	245	534	352	254
	×2	×1	×8	×7	×9	×6	×5

MULTIPLYING BY FIVE

You know these:
Write the reverse and its product for each.

2	3	4	5
×5	×5	×5	×5
10	15	20	25



Picture 1 Picture 2 Picture 3 Picture 4

1. Draw 5 pictures just like picture 1. Then count all the crosses to see how many crosses there are if you have five times 6 crosses. 6 + 6 + 6 + 6 + 6 = ?

2. Draw 5 pictures just like picture 2. Count to see how many circles five times 7 circles make.

3. Draw 5 pictures just like picture 3. How many lines are five times 8 lines?

4. Draw 5 pictures just like picture 4. How many triangles are five times 9 triangles?

To find these answers a shorter way, learn the products below.

These are new. Study and learn them.

0	1	6	7	8	9
×5	×5	×5	×5	×5	×5
0	5	30	35	40	45

Count by 5's from 0 to 45; from 45 back to 0.

I. Products to Name

9	0	5	3	5	9	7	6	5	2
5	5	4	5	7	5	5	5	8	5
5	8	5	1	4	5	3	1	4	5
1	5	6	5	5	9	5	5	5	7
5	5	8	2	7	0	6	5	5	
5	2	5	5	5	5	5	3	5	

Make a Practice card for each combination you need to study.

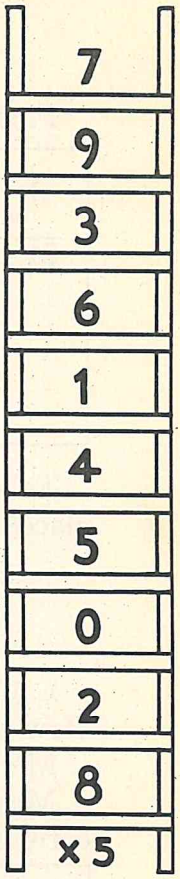
II. Problems to Read and Do

How much would 5 of any of the following cost?

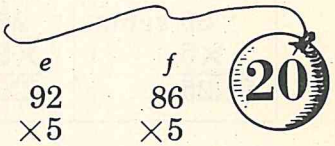
a. 5-cent pencils
b. 8-cent balloons
c. 6-cent tablets
d. 9-cent masks
e. 7-cent whistles
f. 4-cent balls

III. Climbing a Number Ladder

a. Multiply each number on the ladder by 5.
b. Multiply by 5 and add four to each product.
c. Multiply by 5 and add three, two, or one.



LET'S PRACTICE



	a	*b*	*c*	*d*	*e*	*f*
1.	36	84	70	59	92	86
	×5	×5	×5	×5	×5	×5
2.	417	590	387	601	524	231
	×5	×5	×5	×5	×5	×5

MULTIPLYING CENTS

Find the cost of 4 circus tickets at $.35 each.

$.35	**35¢**	Since the cost is more than 100 cents, separate dollars and cents with a decimal point and place a $ sign before the product.
×4 or	**×4**	
$1.40	**$1.40**	

35 cents may be written 35¢ or $.35
140 cents should be written $1.40

Talk about these examples. How are the money signs placed? When are the $ sign and decimal point used?

a.	*b.*	*c.*	*d.*	*e.*
$.60	$.50	15 cents	$.40	83¢
×3	×5	×4	×2	×5
$1.80	$2.50	60 cents	$.80	$4.15

1. Children's tickets for the circus were 25 cents. How much did 5 tickets cost?

Mary and Dick both worked the problem above.

Miss Allen said that Mary's answer was written correctly. She said that Dick's answer was correct in meaning, but that it was not written correctly. Can you explain why Mary's answer is more correct than Dick's?

Mary's work	**Dick's work**
25 cents	**25 cents**
×5	**×5**
$1.25	**125 cents**

	a	*b*	*c*	*d*	*e*	*f*
2. **4 ×**	$.48	19¢	$.72	60¢	$.23	98 cents
3. **5 ×**	$.70	69¢	$.18	92¢	$.74	50 cents

MULTIPLYING DOLLARS AND CENTS

Jack can sell his puppies for $3.50 each. How much will he receive if he sells 4 puppies?

$3.50 **×4** **$14.00**	Since the cost is more than 100 cents, separate dollars and cents with a decimal point and place a $ sign before the product.

See how the money signs are placed in each product below.

a.	*b.*	*c.*	*d.*	*e.*
$4.75	$8.00	$8.60	$6.78	$5.79
×5	×3	×4	×2	×4
$23.75	$24.00	$34.40	$13.56	$23.16

Practice in Multiplying Dollars and Cents

Multiply each number in each row by the number at the left.

	a	*b*	*c*	*d*	*e*	*f*
1. 3 ×	$4.65	$9.30	$7.25	$1.98	$7.16	$3.42
2. 4 ×	$8.00	$3.76	$4.19	$5.42	$9.30	$1.28
3. 5 ×	$3.26	$8.00	$1.94	$5.68	$7.31	$9.20

4. Find the cost of 3 playground balls at $2.98 each.

*For Those Who Need More Practice

	a	*b*	*c*	*d*	*e*	*f*
1. 2 ×	$9.50	$7.24	$8.16	$9.30	$5.00	$8.49
2. 4 ×	$8.45	$9.16	$2.69	$7.00	$5.48	$3.27
3. 5 ×	$6.32	$8.09	$5.71	$9.78	$4.00	$6.45

ZERO IN ONES' PLACE IN THE QUOTIENT

Four boys gathered 520 walnuts. If they divide them equally, how many nuts will each boy receive?

520 means 5 hundreds, 2 tens, and 0 ones.

Step 1

```
  1
4)520
  4
  1
```

Divide the 5 hundreds by 4. Write the 1 in the hundreds' place. Why was this 1 written above the 5? Subtract 4 from 5 and write the remainder 1.

Step 2

```
  13
4)520
  4x
  12
  12
```

This is 1 hundred. Think of this hundred as 10 tens. Bring down the 2 tens, making 12 tens. The x mark shows that the 2 was brought down. Divide 12 tens by 4 and write 3 tens in the quotient. Why was the 3 written above the 2?

Step 3

```
  130
4)520
  4xx
  12
  12
   0
```

Since there is no remainder from the last subtraction, bring down the zero. This zero shows that there are no ones. There will be no ones in the quotient. Write 0 in the quotient to hold the ones' place.

Each boy received 130 nuts.

Explain these examples. Name the missing numbers.

a.	160	270	240	*b.* 25?	130	19?
	4)640	3)810	4)960	3)750	4)520	3)570
	4xx	6xx	8xx	6xx	4xx	3xx
	24	21	16	15	12	27
	24	21	16	15	12	27
	0	0	0	0	?	?

Find these quotients. Check your work carefully.

	a	*b*	*c*	*d*	*e*	*f*
1.	4)720	3)510	2)980	4)600	4)760	2)560
2.	4)560	3)480	2)700	4)680	3)570	2)740

EXAMPLES WITH ZERO FINAL IN QUOTIENT

```
   150 r2
3)452
  3x x
  15
  15
    2
```

How is this example different from the example you learned to do on page 98? What place does zero hold in the quotient in the problem on page 98? What place does the zero hold in the example here? What would happen to the quotient in these two examples if the zero were left out of each?

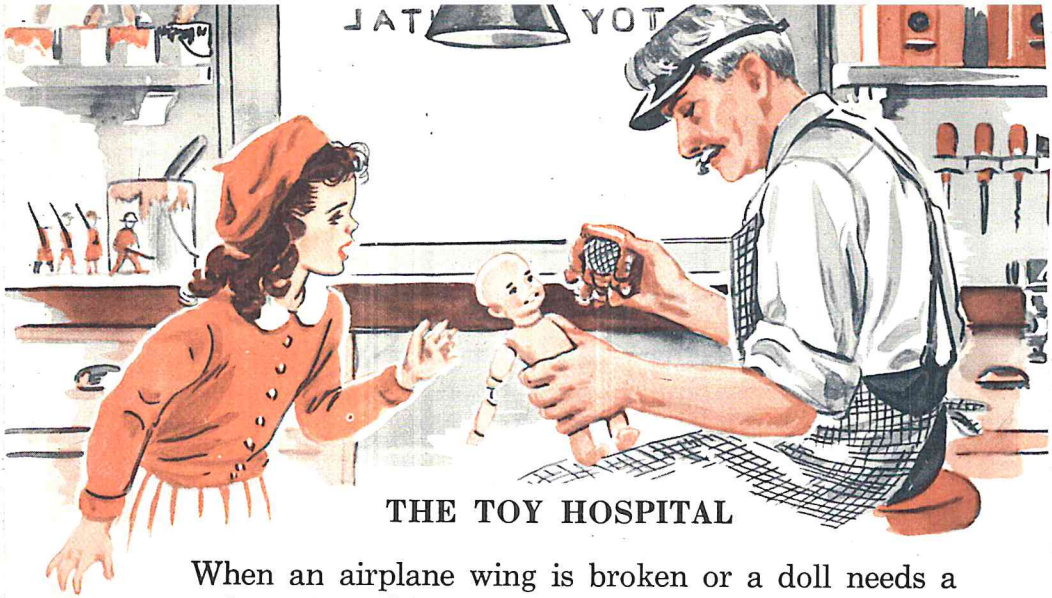
	a	*b*	*c*	*d*	*e*	*f*
1.	4)963	3)811	2)701	4)763	3)782	2)981
2.	4)603	3)542	2)541	4)722	3)571	4)923

```
   50 r3
4)203
  20x
    3
```

How is this example different from the one explained above? Show that to begin working this example you must divide 20 tens by 4. Why is the answer to this example 50 with a remainder of 3?

Find these quotients. Check each example carefully.

	a	*b*	*c*	*d*	*e*	*f*
3.	4)362	4)323	4)202	3)122	4)203	2)121
4.	4)283	4)322	3)151	4)243	3)182	4)122
5.	3)242	4)169	2)49	2)93	3)204	3)271
6.	4)829	4)337	3)720	2)141	4)92	4)58
7.	3)222	4)721	3)915	4)960	3)812	4)520



THE TOY HOSPITAL

When an airplane wing is broken or a doll needs a new leg, "Mr. Steve" at the toy hospital knows how to fix them as good as new.

1. Martha brought her doll to the hospital. She paid 65 cents for a new wig, 28 cents for new eyes, and 9 cents to have an arm mended. How much did dolly's repairs cost in all?

2. Mr. Steve mounted 64 bird feathers in 4 glass frames for Peter. He placed the same number of feathers in each frame. How many feathers were put in each frame?

3. Mr. Steve charges 5 cents apiece to give toy soldiers a fresh coat of paint. Ned brought 18 soldiers to be painted. How much did he have to pay for this work?

4. It will cost $1.25 to mend Fred's coaster wagon. A new wagon would cost $6.00. How much money will Fred save by repairing the old wagon and using it?

5. Mr. Steve makes and sells bird houses at 75 cents each. How much did he receive for 5 of them?

LET'S SEE IF WE KNOW HOW

Work the examples on this page one group at a time.

Addition

	a	*b*	*c*	
1.	409	480	270	(13)
	105	378	130	
2.	758	749	607	(13)
	789	558	899	
3.	309	199	76	(13)
	81	6	629	

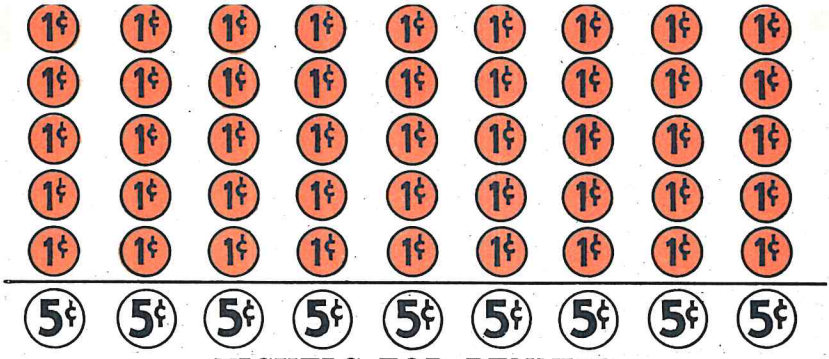
	a	*b*	*c*	
4.	69	13	77	(101)
	89	8	46	
	76	95	7	
		86	69	
5.	$5.44	$4.35	$5.87	(104)
	7.99	7.68	.35	
	7.85	9.74	5.35	

Subtraction

	a	*b*	*c*	
1.	90	67	40	(18)
	37	59	34	
2.	981	870	576	(19)
	244	368	507	
3.	811	385	803	(19)
	693	299	505	
4.	671	712	105	(19)
	72	4	8	

	a	*b*	
5.	800	500	(48)
	352	49	
6.	$9.26	$8.09	(107)
	$6.19	$7.37	
7.	$41.25	$69.80	(107)
	6.97	68.90	
8.	$20.54	$380.75	(107)
	.49	380.66	

If you have difficulty, turn to the page given at the right of each group of examples for help.



NICKELS FOR PENNIES

"I'm going to change my pennies into nickels so that I can fill my new nickel bank," said Ben. So he laid his pennies in rows of 5 pennies to a row to see how many nickels he would get for them.

1. How many pennies are in the first 2 rows of pennies?
2. How many nickels can Ben get for 10 pennies?

Copy the chart below and fill in the missing numbers.

Number of Pennies	Number of Nickels	Division Facts	Number of Pennies	Number of Nickels	Division Facts
0	(0)	$5\overline{)0}$ = 0	25	(?)	$5\overline{)25}$ = 5
5	(?)	$5\overline{)5}$ = 1	30	(?)	$5\overline{)30}$ = 6
10	(?)	$5\overline{)10}$ = 2	35	(?)	$5\overline{)35}$ = 7
15	(?)	$5\overline{)15}$ = 3	40	(?)	$5\overline{)40}$ = 8
20	(?)	$5\overline{)20}$ = 4	45	(?)	$5\overline{)45}$ = 9

Count by 5's from 0 to 45; from 45 back to 0.

QUOTIENTS TO NAME

It helps to remember the fives in division if you match each division combination fact with a multiplication fact, as: $5\overline{)35}$, $7 \times 5 = 35$. What number that you need in the division fact do you see in the multiplication fact? Write the multiplication fact which is helpful in remembering each of these:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	$5\overline{)35}$	$5\overline{)20}$	$5\overline{)30}$	$5\overline{)10}$	$5\overline{)40}$	$5\overline{)5}$	$5\overline{)45}$
2.	$5\overline{)25}$	$5\overline{)35}$	$5\overline{)0}$	$5\overline{)30}$	$5\overline{)45}$	$5\overline{)15}$	$5\overline{)40}$

Make a Practice Card for each combination above that you find hard. Find these quotients.

	a	*b*	*c*	*d*	*e*	*f*
1.	$5\overline{)100}$	$4\overline{)820}$	$3\overline{)624}$	$5\overline{)450}$	$3\overline{)327}$	$4\overline{)824}$
2.	$3\overline{)186}$	$5\overline{)150}$	$4\overline{)284}$	$5\overline{)305}$	$5\overline{)255}$	$4\overline{)320}$
3.	$5\overline{)300}$	$5\overline{)350}$	$5\overline{)155}$	$4\overline{)240}$	$5\overline{)400}$	$5\overline{)200}$
4.	$4\overline{)75}$	$4\overline{)380}$	$4\overline{)150}$	$4\overline{)201}$	$4\overline{)816}$	$4\overline{)60}$
5.	$4\overline{)362}$	$3\overline{)221}$	$5\overline{)620}$	$2\overline{)69}$	$4\overline{)540}$	$3\overline{)612}$
6.	$5\overline{)305}$	$4\overline{)763}$	$2\overline{)71}$	$5\overline{)555}$	$3\overline{)410}$	$2\overline{)90}$

*For Those Who Do Not Need More Practice

1. Draw five large rectangles on a sheet of paper.
2. Divide the first one into halves. Color $\frac{1}{2}$ of it.
3. Divide the second one into thirds. Color $\frac{2}{3}$ of it.
4. Divide the third one into fourths. Color $\frac{3}{4}$ of it.
5. Divide the next one into fifths. Color $\frac{2}{5}$ of it.
6. Divide the last one into eighths. Color $\frac{5}{8}$ of it.

5 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B	C	D
$5\overline{)0}$ (quotient 0)	1	2	3	4
$5\overline{)5}$ (quotient 1)	6	7	8	9
$5\overline{)10}$ (quotient 2)	11	12	?	?
$5\overline{)15}$ (quotient 3)	16	17		
$5\overline{)20}$ (quotient 4)	21	22		
$5\overline{)25}$ (quotient 5)	26	27		
$5\overline{)30}$ (quotient 6)	31	32		
$5\overline{)35}$ (quotient 7)	36	37		
$5\overline{)40}$ (quotient 8)	41	42		
$5\overline{)45}$ (quotient 9)	46	47		

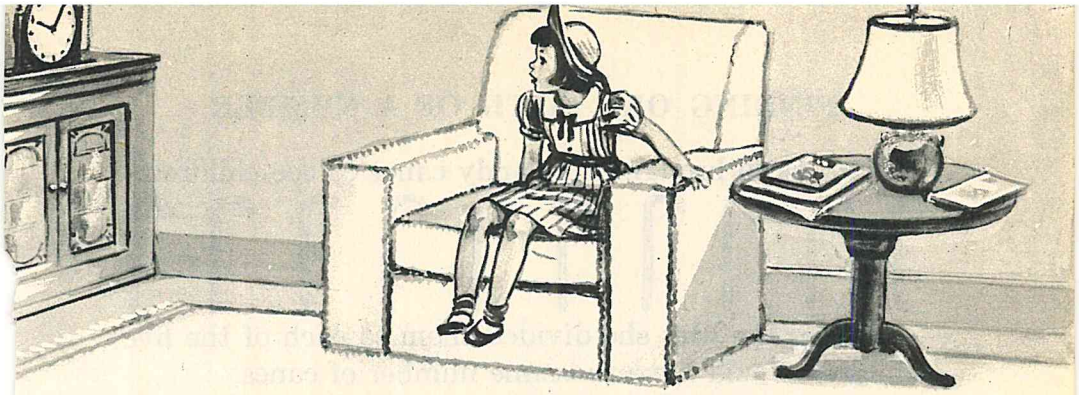
1. When you are asked to divide examples like this: $5\overline{)85}$, you will need to think $5\overline{)8}$. You will not find this fact in the even division table of 5's because 5 is not contained in 8 without a remainder. But the even division table of 5's will help you to find the right quotient figure.

2. You will notice in the chart at the left that to divide numbers 1, 2, 3, and 4 by 5 we must think back to $5\overline{)0}$, because these numbers come between $5\overline{)0}$ and $5\overline{)5}$.

3. What numbers come between $5\overline{)5}$ and $5\overline{)10}$? To what combination should you think back when dividing each of these numbers by 5?

4. Copy the chart and complete rows A, B, C, and D for each of the division combinations of 5. Make the chart like the one on page 85.

5. Use the chart you have made to find out what number you should think back to when dividing each of the following numbers by **5**: 22, 33, 49, 42, 36, 14, 16, 8, 24, 3, 37, 46, 26, 43, 32, 29, 4, 13, 7, 19, 48, 41, 28, 39, 31, 23, 17, 47, 12, 44, 18, 38.



WHEN CHILDREN NEED TO TELL TIME

1. Ruth had an appointment with the dentist at 10:30 Saturday morning. She looked at the clock. It was 10:05. How long did she have to wait?

2. Ray began his violin lesson at 4:15. He must play for a half hour. When will he be through?

3. Jack and Ben just missed the 3:20 bus. There will be another bus in 15 minutes. When will it reach their corner?

4. Harry's watch is 10 minutes fast. The watch says it is 5:30. What is the correct time?

5. The girls were cooking candy. The recipe said to let it boil for 20 minutes. It started to boil at 1:15. When will it be done?

LET'S PRACTICE

21

1. $2.70 × 5
2. 5)750
3. $80.50 − 9.78
4. 39¢ × 5
5. 5)543
6. $4.15 × 5

7. 47 + 98 + 69
8. $6.89 × 5
9. 843 − 79 = 687
10. 5)354
11. $7.49 + 8.98
12. $27.00 − 26.93

FINDING ONE FIFTH OF A NUMBER

Aunt Beth brought ten candy canes to the children.

This is the way she divided them so each of the five children would have the same number of canes.

Look at the first picture above. How many candy canes did Aunt Beth bring in all?

Look at the second picture to see into how many equal groups she divided them. How many candy canes are there in each group?

Each of five equal groups is called one fifth of the total number. **One fifth is written $\frac{1}{5}$.**

One fifth of 10 candy canes is how many candy canes? $\frac{1}{5}$ of 10 = ?

Find $\frac{1}{5}$ of:

	a	*b*	*c*	*d*
1.	30 minutes	50 cents	45 children	10 weeks
2.	15 days	100 marbles	20 dollars	150 chairs
3.	5 cookies	35 years	40 inches	25 books

4. Jessie wants to share 35 peanuts with her four friends. "There are 5 of us in all. Each of us must have $\frac{1}{5}$ of the peanuts," thought Jessie. How many peanuts did each child receive if she divided them equally?

FRACTIONS ARE ALL AROUND US

Tell how fractions are used in these pictures:

1. A bus stops here on the quarter hour. At what time will a bus stop between 9:00 and 10:00 A.M.?

2. The airplane Jack wants to buy costs a half dollar. Jack has only a quarter. Why is he asking his father for a quarter?

3. Janet must know how to read eighth notes, quarter notes, and half notes. In your music book find one of each kind of note.

4. Mother has bought three fourths of a pound of cheese. Is this more than a half pound?

5. These children drink one-half pint of milk each day during the school lunch period. A half pint fills how many glasses?

6. Mother must use three fourths of a cup of butter for this chocolate cake. Draw a measuring cup and show how much of it Mother must fill.

LET'S SEE IF WE KNOW

Set 1 + Addition +

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	43	3	26	908	874	965	67
	64	49	84	129	390	435	345
2.	309	6	8	36	$9.00	$4.99	$ .72
	8	6	7	9	5.96	.52	8.76
		5	9	58			9.18
			5	97			.07

Set 2 — Subtraction —

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	29	60	103	90	45	74	843
	20	0	30	25	38	6	509
2.	900	696	304	900	$7.47	$27.93	$207.63
	740	598	6	817	5.68	.48	98.97

Set 3 × Multiplication ×

	a	*b*	*c*	*d*	*e*	*f*	*g*
1. 5 ×	40	71	96	831	706	582	92 cents
2. 5 ×	85¢	$.91	$7.34	$6.03	$5.21	$4.00	$9.87

Set 4 ÷ Division ÷

	a	*b*	*c*	*d*	*e*	*f*
1.	4)80	5)505	5)400	5)49	5)85	5)79
2.	5)150	4)389	5)302	4)432	5)520	5)950

WE USE FRACTIONS

1. Clark earns 20 cents a week. He wants to save $\frac{1}{4}$ of it each week. How much will he save each week? How much can he spend each week?

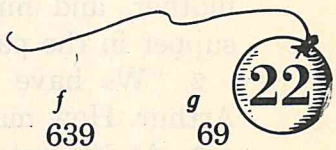
2. Jane needs $\frac{1}{4}$ of a yard of ribbon for a bow. She found a ribbon 12 inches long. Was this enough to make the bow?

Taffy
1 pound 40¢
$\frac{1}{2}$ pound ??
$\frac{1}{4}$ pound ??

3. Tom was making this sign for the school candy sale. What figure did he write for the $\frac{1}{2}$ pound and the $\frac{1}{4}$ pound prices?

4. Jim's mother said, "You may go out to play after you practice your cornet lesson for $\frac{1}{2}$ hour." How many minutes did Jim have to practice?

LET'S PRACTICE

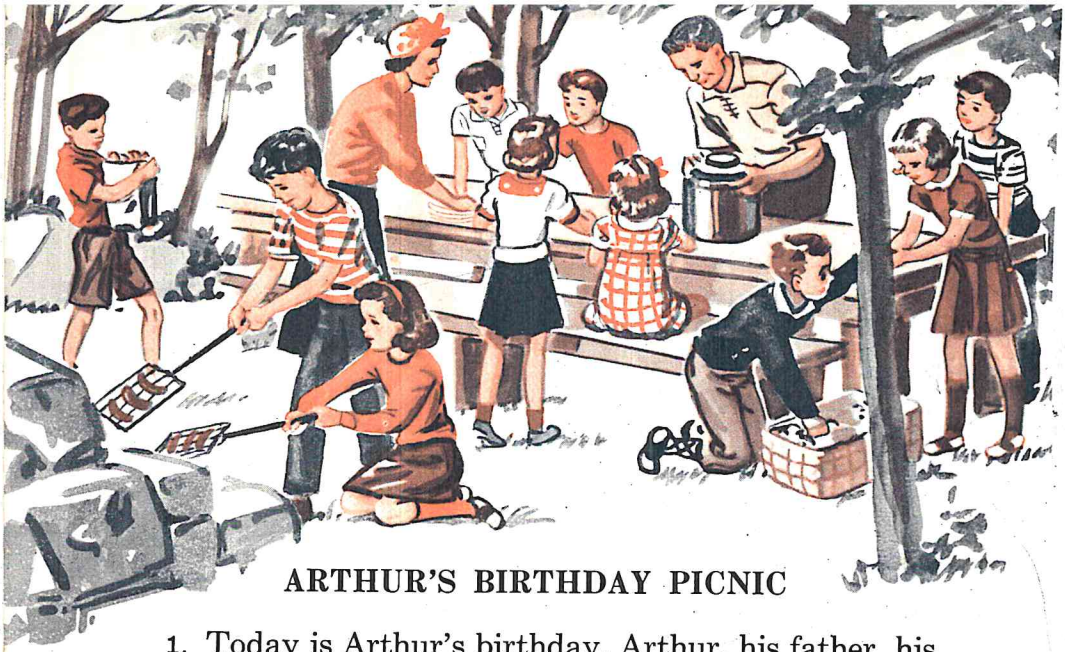


+ Addition +

	a	b	c	d	e	f	g
1.	76	8	73	508	680	639	69
	90	65	67	679	678	798	586
2.	409	5	8	76	$5.80	$7.86	$9.59
	7	8	8	98	9.00	.07	.45
		6	9	38			8.87
			7				4.79

— Subtraction —

	a	b	c	d	e	f	g
1.	68	44	107	90	84	56	987
	60	4	60	32	78	9	708
2.	805	795	608	900	$8.67	$30.55	$503.45
	590	696	9	598	6.69	.49	63.87



ARTHUR'S BIRTHDAY PICNIC

1. Today is Arthur's birthday. Arthur, his father, his mother, and nine of his friends are having a picnic supper in the park. How many are there in all?

2. "We have 3 frankfurters for each person," said Arthur. How many frankfurters did they have in all?

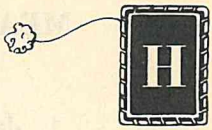
3. At 10 cents a dozen, how much did 3 dozen buns cost? Why do you think they bought 3 dozen buns?

4. At the grocery store Arthur spent 35¢ for butter, 28¢ for pickles, and 29¢ for oranges. How much did these groceries cost? How much change did Arthur receive from a $1 bill which he gave the clerk?

5. Mother baked two chocolate cakes. She cut each cake into 10 pieces. How many pieces did she cut?

*6. Could everyone at the picnic have two pieces of cake? Explain. Would there be enough pieces to give Mother and Father each one piece, and each of the children two pieces? Explain your answer.

LET'S SEE IF WE KNOW HOW



Multiplication

	a	*b*	*c*			*a*	*b*	*c*	
1.	85	27	34	**(28)**	5.	\$.56	\$.29	\$.35	**(116)**
	4	4	3			5	5	8	
2.	491	682	360	**(79)**	6.	17¢	80¢	78¢	**(116)**
	4	3	4			5	5	3	
3.	205	709	824	**(80)**	7.	34 cents	18 cents	97 cents	**(116)**
	6	3	4			5	5	5	
4.	195	186	354	**(81)**	8.	\$6.54	\$3.94	\$2.03	**(117)**
	3	2	9			5	2	7	

Division

	a	*b*	*c*	*d*	*e*	
1.	4)27	5)23	3)25	2)17	5)37	**(59)**
2.	5)65	3)81	4)72	2)54	5)90	**(67)**
3.	2)93	4)63	5)84	3)74	5)79	**(66)**
4.	5)470	4)316	3)285	2)118	5)145	**(61)**
5.	4)175	3)203	5)432	2)159	5)189	**(90)**
6.	3)312	2)212	5)510	5)535	4)824	**(98)**
7.	4)837	4)419	3)926	2)817	4)435	**(98)**
8.	3)780	4)960	2)920	4)720	4)600	**(118)**
9.	4)523	3)812	2)501	4)762	3)781	**(119)**
10.	4)283	5)254	3)272	5)304	2)161	**(119)**

MEASURING YOUR GROWTH IN PROBLEM SOLVING III

1. Jane has 8 dolls. Her little sister Ann has 7 dolls. How many dolls do the two girls have together?

2. If you went to the post office to buy stamps, how many 3-cent stamps could you buy for 30 cents?

3. At the school fair Tom bought 4 candy bars. They cost 5 cents apiece. How much did Tom spend for the candy bars?

4. Roger has 25 brown marbles, 20 red marbles, and 25 blue marbles. How many marbles has he in all?

5. Ellen picked 21 tulips from her flower garden. Eight of the tulips were white. The rest were red. How many red tulips did Ellen pick?

6. Jean is 48 inches tall. How many inches more must she grow before she will be 52 inches tall?

7. Arthur has 68 cents. Paul has 72 cents. How much less than Paul has does Arthur have?

8. Mary's mother bought 4 pounds of meat at 36 cents a pound. How much did she pay for the meat?

9. Bob's new cap cost $1.75. His new shoes cost $4.25. How much did his cap and shoes cost?

10. The fourth grade had a flower sale to raise money for a radio. Alice sold 3 plants for 75 cents. If all the plants were the same price, how much did she receive for each plant?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

ACROSS THE BRIDGE TO THE NEW CHAPTER

1. Explain the meaning of each of the following words:

decimal point	quarter	miles
one fifth	dollars and cents	carrying in addition
three fourths	full-fare ticket	4:15 o'clock
dollar sign	one-half fare	sale price

2. Read the following prices:

   a. \$3.04 *b.* \$15.05 *c.* \$20.00 *d.* \$8.75 *e.* \$18.13

3. Write these prices in dollars and cents:

   a. Five dollars and ninety cents.
   b. Twenty dollars and two cents.
   c. Fifteen dollars and thirty cents.
   d. Eighty-six dollars and thirty-five cents.
   e. One hundred dollars and ten cents.

4. To which number would you think back when dividing each of the following numbers by **4**; by **5**?

26	31	34	14	9	17	23	29
33	27	22	13	6	39	11	37

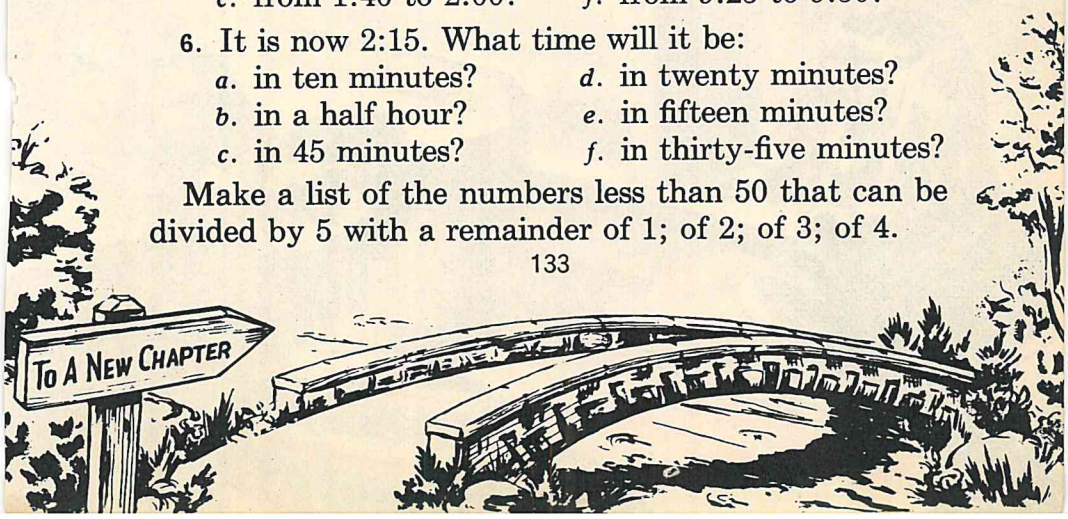
5. How many minutes is it:

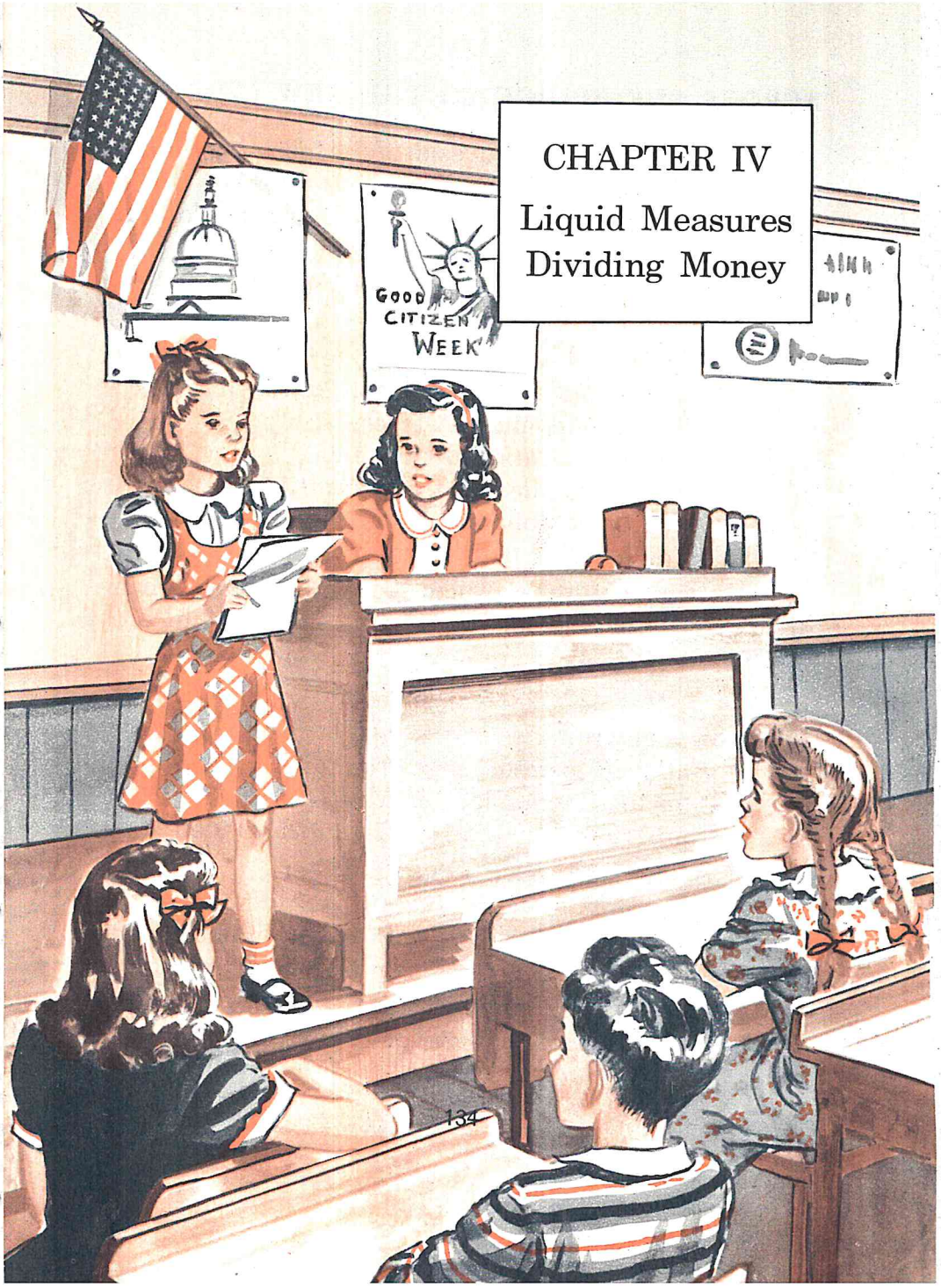
   a. from 2:05 to 2:50?
   b. from 10:15 to 10:35?
   c. from 1:40 to 2:00?
   d. from 4:45 to 4:55?
   e. from 5:10 to 6:00?
   f. from 9:25 to 9:50?

6. It is now 2:15. What time will it be:

   a. in ten minutes?
   b. in a half hour?
   c. in 45 minutes?
   d. in twenty minutes?
   e. in fifteen minutes?
   f. in thirty-five minutes?

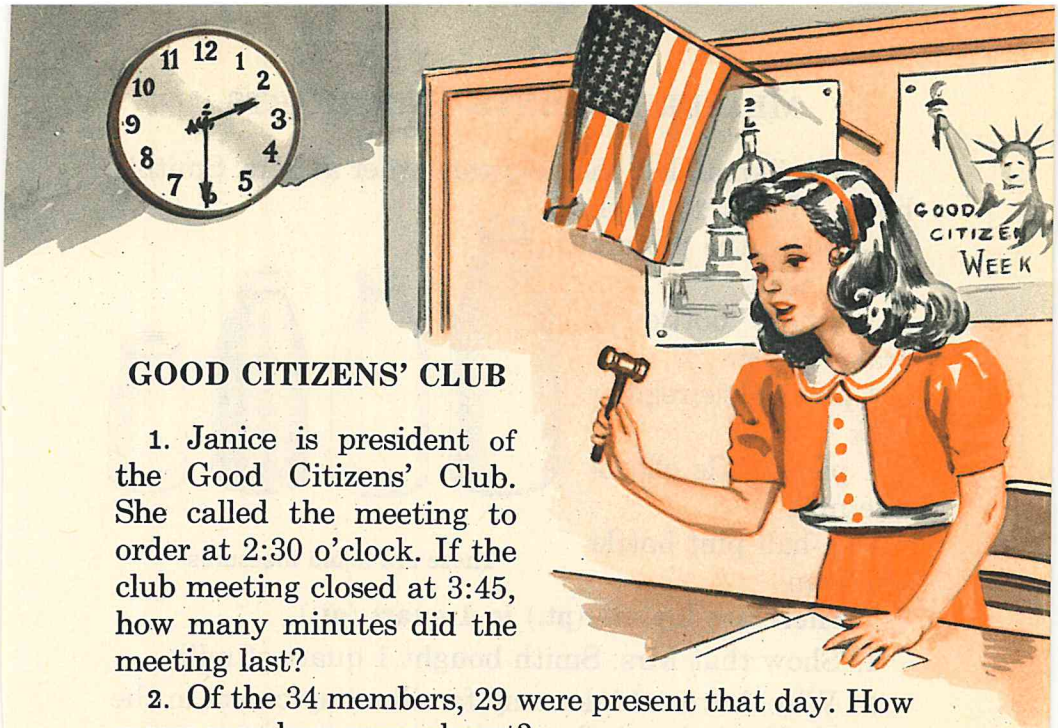
Make a list of the numbers less than 50 that can be divided by 5 with a remainder of 1; of 2; of 3; of 4.





CHAPTER IV

Liquid Measures
Dividing Money



GOOD CITIZENS' CLUB

1. Janice is president of the Good Citizens' Club. She called the meeting to order at 2:30 o'clock. If the club meeting closed at 3:45, how many minutes did the meeting last?

2. Of the 34 members, 29 were present that day. How many members were absent?

3. Twelve children acted in a citizenship play. Two more children were on the costume committee and 4 children were in charge of the stage. How many children in all took part in putting on this play?

4. Thirty children from another room gave a flag drill. They marched into the room in groups of 5 children each. How many groups were there?

5. The club voted to raise money to buy 3 pictures for their room. At $3.75 each, how much money must they raise to buy the pictures?

6. How much less than $12.00 must they raise?

*7. Tell some ways you think the club might earn this money.

MEASURING PINTS AND QUARTS

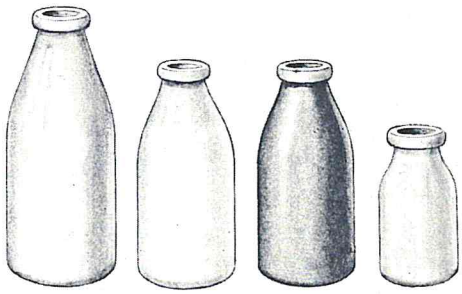
The milkman left the following order at Mrs. Smith's house. Point to each amount in the picture at the right.

1 quart bottle of orange juice

1 pint bottle regular milk

1 pint bottle chocolate milk

One-half pint bottle of cream



These are liquid measures

There are 2 pints (pt.) in 1 quart (qt.)

1. Show that Mrs. Smith bought 1 quart of milk.

2. Why do you think many families buy cream in the small half-pint bottles?

3. Which is more, one-half pint of cream, or one-half quart of cream? Prove your answer.

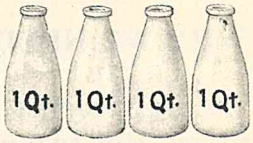
4. Ice cream was 60 cents a quart. Edna asked to buy a pint of ice cream. What part of a quart is one pint? Then how much did Edna pay for the pint of ice cream?

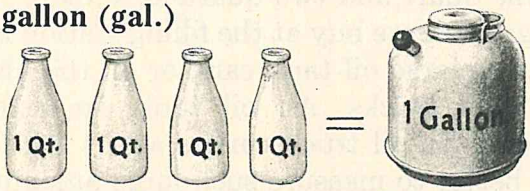
5. One quart of milk will fill 4 glasses. If Jerry wants to serve 24 glasses of chocolate milk at his party, how many quarts of chocolate milk will his mother need to buy?

*6. Find the price of 5 things that your mother buys that are sold by the quart. Then find the cost of: 2 quarts of each; 3 quarts of each; 4 quarts of each.

JIM LEARNS ABOUT GALLONS

Jim's share in getting ready for the picnic was to bring the milk. Here is a picture of the milk he was supposed to bring. Four quart bottles are hard to carry, so Jim borrowed his Dad's gallon thermos jug. Jim poured the four quart bottles of milk into the gallon thermos jug. When he had finished pouring, the four quart bottles were empty and the gallon thermos jug was full. Jim learned that **there are four quarts (qt.) in 1 gallon (gal.)**





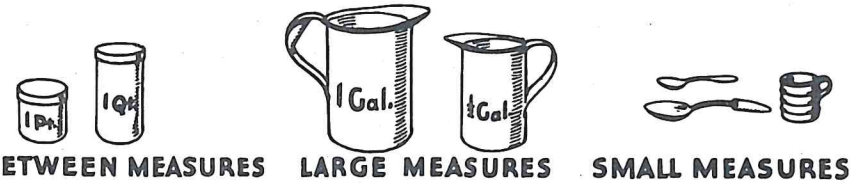
Try to get a gallon measure and a quart measure. Prove that there are 4 quarts of water in one gallon.

1. A grocer wanted to put vinegar into quart bottles for a sale. He used 4 quart bottles for each gallon of vinegar. How many bottles did he use for 3 gallons?

2. Gasoline sold at 19 cents a gallon. How much did Tom's father pay for 5 gallons of gasoline?

3. Tom's father said, "My car can go 16 miles on one gallon of gasoline." How many miles will the car go on the 5 gallons of gasoline he has just bought?

4. The hotel ordered 24 quarts of ice cream in quart bricks. Draw 24 squares to show how these bricks would look. Draw a circle around each group of 4 bricks. Now count your circles and tell how many gallons of ice cream were ordered.



WHY WE NEED DIFFERENT LIQUID MEASURES

1. Mrs. Jones needed more than a quart of milk today. But two quarts were too much. So she asked the milkman to leave a quart bottle and a pint bottle of milk. Show that the pint bottle helped her to buy in-between one quart and two quarts of milk.

2. The gasoline we buy at the filling station is shipped by railroad in large oil tank cars, or on the highway in large oil tank trucks. An oil tank car holds about 8,000 gallons. An oil truck carries about 1,000 gallons. Why is it better to measure such large amounts by the gallon than by the quart or by the pint?

3. We do not use as much oil for an automobile as we use gasoline. Therefore we ask for a quart of oil instead of a gallon of oil. We could ask for $\frac{1}{4}$ of a gallon of oil instead of a quart of oil. Why is it easier to buy the oil by the quart?

4. Tell when we would need different sized liquid measures for each of the following:

lemonade milk paint cream vinegar ice cream

MAKING LEMONADE

1. Alice and Perry were making lemonade. They had a dozen lemons. They used 4 of them. How many lemons were left?

2. What a big pitcher of lemonade they made! Perry stirred and stirred it with a big spoon to mix the sugar and the water. He stirred 25 times to the right. He stirred 25 times to the left. How many times did he stir the lemonade?

3. They made enough lemonade to fill six glasses. A glass is about a half pint of lemonade. A whole pint filled how many glasses?

4. A quart filled how many glasses? Now can you tell how much lemonade it took to fill all six of the glasses?

5. If they put 2 ice cubes in each glass, how many ice cubes did they need for 6 glasses?

DIVIDING DOLLARS AND CENTS

The school principal paid $7.20 for 4 large balls for the playground. How much did the balls cost apiece?

```
   $1.80
4)$7.20
   4 x x
   3 2
   3 2
     0
```

Work this example just as if the money signs were not there. In this example the quotient figures show that the cost of one ball is more than 100 cents. Separate dollars and cents with a decimal point and place a dollar sign before the quotient.

Study these division examples where only the quotients are written. See how the money signs are placed in the quotient. What do you notice about the two decimal points in each example that has been worked?

```
   $3.40        $2.00        $3.02        $1.20
2)$6.80      4)$8.00      3)$9.06      4)$4.80
```

Now study these division examples where all the work is shown. See how the money signs are placed.

```
   $2.85        $1.30        $2.08        $1.04
2)$5.70      5)$6.50      3)$6.24      5)$5.20
   4 x x        5 x x        6 x x        5 x x
   1 7          1 5          24           20
   1 6          1 5          24           20
     10           0
     10
```

1. Copy, and work the examples on this page with your book closed.

2. Open your book and compare your work with the models on this page. Correct your mistakes.

PRACTICE IN DIVIDING DOLLARS AND CENTS

Set 1

Work these examples by writing the quotients only.

	a	*b*	*c*	*d*	*e*
1.	3)$3.69	2)$2.80	4)$4.00	3)$3.06	5)$5.05
2.	2)$4.26	3)$9.60	5)$5.00	2)$6.80	4)$4.08
3.	2)$8.00	5)$5.50	2)$4.68	4)$8.40	3)$3.00

Set 2

In these examples show all your work.

	a	*b*	*c*	*d*	*e*
1.	4)$9.40	3)$9.24	4)$6.72	5)$7.45	2)$4.16
2.	3)$5.25	4)$4.96	2)$8.70	5)$5.30	3)$8.07
3.	5)$9.25	4)$7.48	5)$6.35	4)$8.36	5)$6.90

*Magic Squares

16	2	3	13
5	11	10	8
9	7	6	12
4	14	15	1

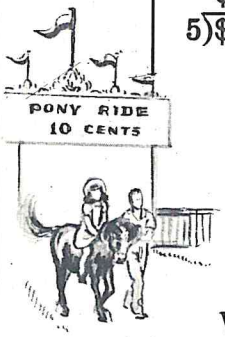
3	9	8	?
5	?	9	8
8	5	3	?
9	8	?	3

Show that the sum of the numbers in each row, in each column, and in each diagonal is the same in the square at the left.

Find the missing numbers in the square at the right.

DIVIDING DOLLARS AND CENTS WHEN THE QUOTIENT IS CENTS

Mother gave the five children $2.70 to spend at the beach. If they divide this money equally, how much is each child's share?




```
   $ .54
5)$2.70
   2 5x
     20
     20
```

$2.70 is 2 dollars, 7 dimes, and 0 cents. It is also 27 dimes and 0 cents.

Since the dollars cannot be divided, as 5)2, change the 2 dollars to 20 dimes. Add the 20 dimes and the 7 dimes. This is 27 dimes.

If 27 dimes is divided by 5, the answer is 5 dimes. This is written above the 7. Why?

```
  5
5)270
  25
   2
```

What do you notice about the decimal point in the quotient and the decimal point in the number you are dividing?

Study these division examples. See where the money signs are placed in the quotients.

```
   $ .31      $ .54      $ .50      $ .79      $ .98
5)$1.55    4)$2.16    4)$2.00    3)$2.37    5)$4.90
   1 5x       2 0x       2 0x       2 1x       4 5x
      5         16          0         27         40
      5         16                    27         40
```

Copy and work the examples above with your book closed. Then open your book and check your work with the work given here. Correct any mistakes.

Explain in what way these examples are different from the money examples you learned to do on page 140.

PRACTICING WHAT YOU HAVE LEARNED

$2.65 means 2 dollars, 6 dimes, and 5 pennies. It also means 26 dimes and 5 pennies. Give these two meanings for each of the amounts of money below before you work the problems.

Find these quotients. Check each example.

	a	*b*	*c*	*d*	*e*
1.	5)$2.60	4)$1.28	4)$3.32	5)$2.00	3)$2.01
2.	3)$1.50	5)$4.00	5)$1.40	5)$1.80	4)$2.08
3.	4)$1.24	4)$3.72	4)$3.20	5)$4.05	4)$2.68

LET'S PRACTICE

23

	a	*b*	*c*	*d*	*e*
1.	4)$3.64	4)$1.52	5)$5.20	5)$1.00	4)$2.36
2.	4)$4.20	5)$4.55	5)$2.40	4)$9.84	5)$2.50
3.	5)$3.75	3)$9.27	5)$3.55	5)$4.45	4)$9.40

*For Those Who Need More Practice

	a	*b*	*c*	*d*	*e*
1.	5)$4.50	5)$7.50	3)$2.55	3)$1.02	3)$2.58
2.	5)$2.05	5)$3.50	3)$8.40	4)$2.92	5)$9.20
3.	4)$7.00	3)$2.91	3)$6.24	5)$3.45	5)$3.05

*For Those Who Do Not Need More Practice

Draw 8 circles. Divide and color the circles so that each circle shows one of the following:

$\frac{1}{2}$; $\frac{1}{4}$; $\frac{1}{3}$; $\frac{2}{2}$; $\frac{3}{4}$; $\frac{2}{3}$; $\frac{3}{3}$; $\frac{4}{4}$.

TAKING CARE OF THE GOLDFISH

In a fish bowl there are 3 small goldfish and 2 large goldfish. Betty sees that there is enough water for them. She found that 4 quarts of water are needed for each fish.

1. How many fish are there in the fish bowl?
2. How many quarts of water are needed for all of the fish?
3. How many gallons of water are needed?
4. If Betty uses a pint bottle to measure the water, how many times must she empty the bottle into the bowl to get the right amount of water?
5. If it takes 4 cupfuls of water to fill a quart bottle, how many cupfuls of water must Betty put into the bowl?

*6. Betty knows that the fresh water for the goldfish must not be too cold. Find out how Betty will tell how cold the water is.

*7. Betty bought a small box of fish food for 5 cents. It lasted 25 days. For how many days could she feed the fish at a cost of 1 cent?

LET'S SEE IF WE KNOW

I

Set 1 + Addition +

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	25	9	34	807	688	953	25
	63	64	86	978	670	748	876
2.	309	8	9	48	$6.87	$4.79	$5.76
	7	6	3	5	5.69	.88	.59
		9	8	79			9.58
			5	79			8.96

Set 2 — Subtraction —

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	37	65	104	70	87	74	986
	30	5	60	24	79	8	707
2.	800	497	508	700	$9.56	$38.65	$605.65
	670	398	9	699	5.79	.59	75.77

Set 3 × Multiplication ×

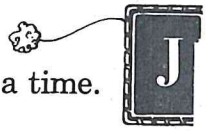
	a	*b*	*c*	*d*	*e*	*f*	*g*
1. 5 ×	81	70	69	581	407	392	56 cents
2. 5 ×	47¢	$.90	$8.45	$2.35	$3.00	$8.79	$5.61

Set 4 ÷ Division ÷

Divide these numbers by 5:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	47	505	350	75	93	180	232
2.	403	528	374	$6.45	$5.10	$4.65	$4.20

LET'S SEE IF WE KNOW HOW



Work the examples on this page one group at a time.

Addition

	a	*b*	*c*	
1.	95	64	2	(13)
	89	36	78	
2.	605	580	487	(13)
	908	877	759	
3.	739	603	7	(13)
	98	27	198	

	a	*b*	*c*	
4.	79	68	57	(101)
	46	39	6	
	86	7	55	
		68	48	
5.	$7.56	$1.23	$9.73	(104)
	4.45	4.79	.53	
	8.56	4.83	9.26	
		9.25	1.40	

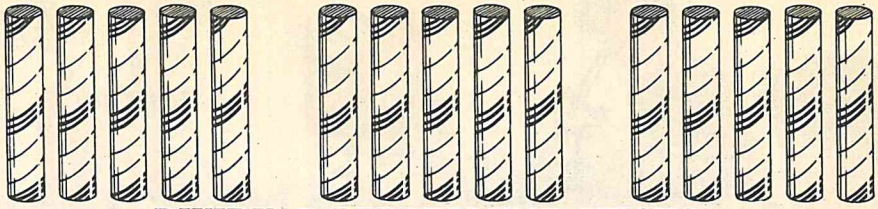
6. How much is $3.44 + $.35 + $4.69 + $2.33? **(104)**

Subtraction

	a	*b*	*c*	
1.	148	105	134	(19)
	55	40	94	
2.	716	758	929	(19)
	324	670	386	
3.	796	634	596	(19)
	227	626	548	
4.	945	804	825	(19)
	696	349	788	

	a	*b*	*c*	
5.	683	407	756	(19)
	84	8	9	
6.	800	700	100	(48)
	569	98	26	
7.	$9.07	$8.07	$7.25	(107)
	8.20	.39	7.19	
8.	$84.40	$50.61	$304.13	(107)
	83.80	.59	56.78	

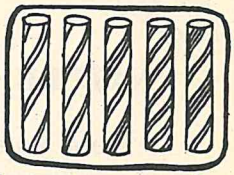
If you have difficulty, turn to the page given at the right of each group of examples.



DIVIDING PEPPERMINT STICKS

1. Count the peppermint candy sticks.

2. If you group them to put $\frac{1}{3}$ of them in each group, how many candy sticks will there be in each group? Draw the 15 candy sticks. Put a circle around each group of 5.



3. Draw a picture to show how to group the 15 candy sticks if you put $\frac{1}{5}$ of them in each group.

4. Could you divide the candy sticks into two equal groups? Can you cut the remaining stick in halves? Then how many sticks will there be in each group?

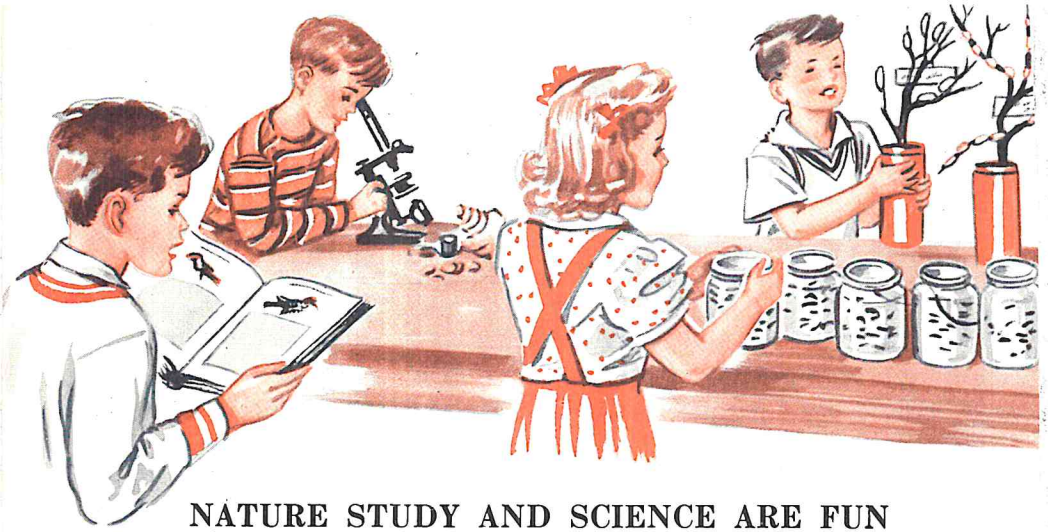
*Making Magic Squares

16	2	★	13
★	11	10	8
9	★	6	12
4	14	15	★

9	★	3	16
4	15	10	★
14	1	★	11
★	12	13	2

The sum of any row or any column is 34. To find a missing number, add the three numbers that are given. Then subtract the sum from 34. The remainder will be the missing number.

Copy these magic squares on a sheet of paper. Then find the missing numbers and write them in.



NATURE STUDY AND SCIENCE ARE FUN

1. Here you see the fourth-grade children arranging their spring science corner. They have caught 120 tiny polliwogs. If they group them equally into 5 glass jars, how many polliwogs will they put in each glass jar?

2. Matthew enjoys the bird picture collection. Out of 80 birds, he named 72 of them correctly. How many did he miss?

3. Each child has bought a 5-cent plant to raise and take home to Mother at Easter time. How much did the plants cost for the 35 children in the class?

4. The class wants to buy a new microscope so that they may examine specimens more closely. They have $3.75 which they earned on a cookie sale. How much more do they need before they can buy an $8.00 set?

5. Last fall the children brought in 19 cocoons of one kind and 6 cocoons of another kind. How many cocoons did they find in all?

*6. So far, moths have come out of 18 of the cocoons. How many cocoons are there still to open?

LET'S SEE IF WE KNOW HOW

K

Multiplication

	a	*b*	*c*			*a*	*b*	*c*	
1.	81	95	56	**(28)**	4.	379	346	682	**(81)**
	4	3	5			5	4	5	
2.	972	790	681	**(79)**	5.	$.60	79¢	15 cents	**(116)**
	2	4	3			2	5	5	
3.	307	408	825	**(80)**	6.	$5.92	$2.84	$1.39	**(117)**
	3	5	2			4	3	2	

Division

	a	*b*	*c*	*d*	
1.	5)47	4)30	4)38	5)29	**(59)**
2.	5)70	4)76	3)84	4)60	**(61)**
3.	4)99	5)93	4)54	5)89	**(66)**
4.	5)310	5)365	4)352	3)291	**(61)**
5.	4)239	5)483	4)269	3)191	**(90)**
6.	5)545	4)424	2)614	3)627	**(98)**
7.	5)523	2)417	4)818	3)314	**(98)**
8.	5)650	4)720	5)900	5)850	**(118)**
9.	5)403	4)243	3)480	2)541	**(119)**
10.	4)$8.28	3)$5.28	3)$5.25	2)$2.00	**(140)**
11.	5)$1.80	4)$3.32	2)$1.30	5)$1.35	**(142)**

If you have difficulty, turn to the page given at the right of each group of examples for help.

MEASURING YOUR GROWTH IN PROBLEM SOLVING IV

1. How much must you pay for 9 stamps at 3 cents each?

2. Bob has 4 black puppies and 6 brown puppies. How many puppies has he in all?

3. On a large table Ted counted 35 small books and 48 large books. How many were there in all?

4. Grace bought a quart of milk for 12 cents. How much change should she receive from a quarter?

5. In the Memorial Day parade the children marched by fours. How many groups of four were there in Tom's class if there were 36 children in the class?

6. In the Johnson School there are 123 boys and 118 girls. How many children are there in this school?

7. Eggs were selling at $.48 a dozen. How much will Mrs. Smith have to pay for 5 dozen eggs?

8. Ethel says that she is exactly 4 feet tall. How many inches tall is she?

9. In an apple orchard there were 75 trees. There were 5 equal rows of trees. How many trees were there in each row?

10. Carl had 120 papers to sell each day. One day he sold all but 14 of them. How many papers did he sell?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

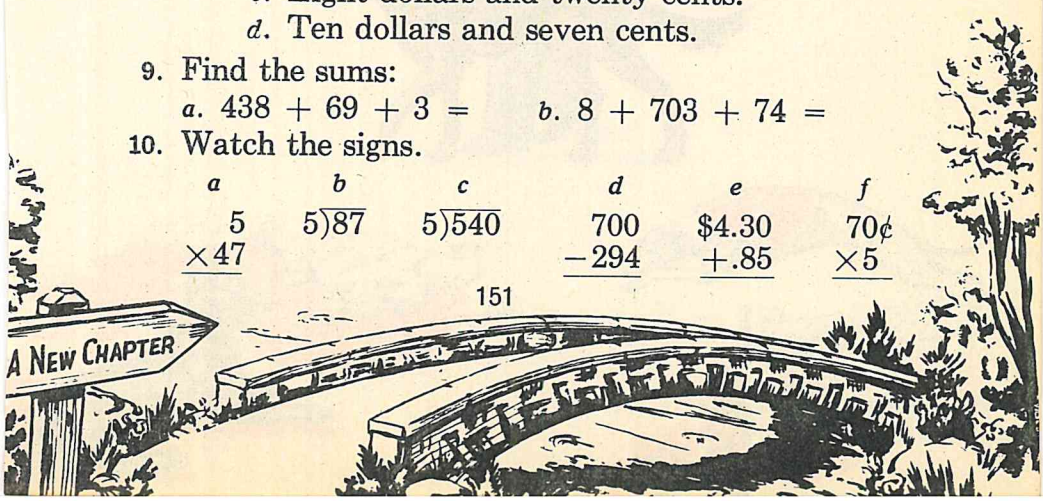
ACROSS THE BRIDGE TO THE NEW CHAPTER

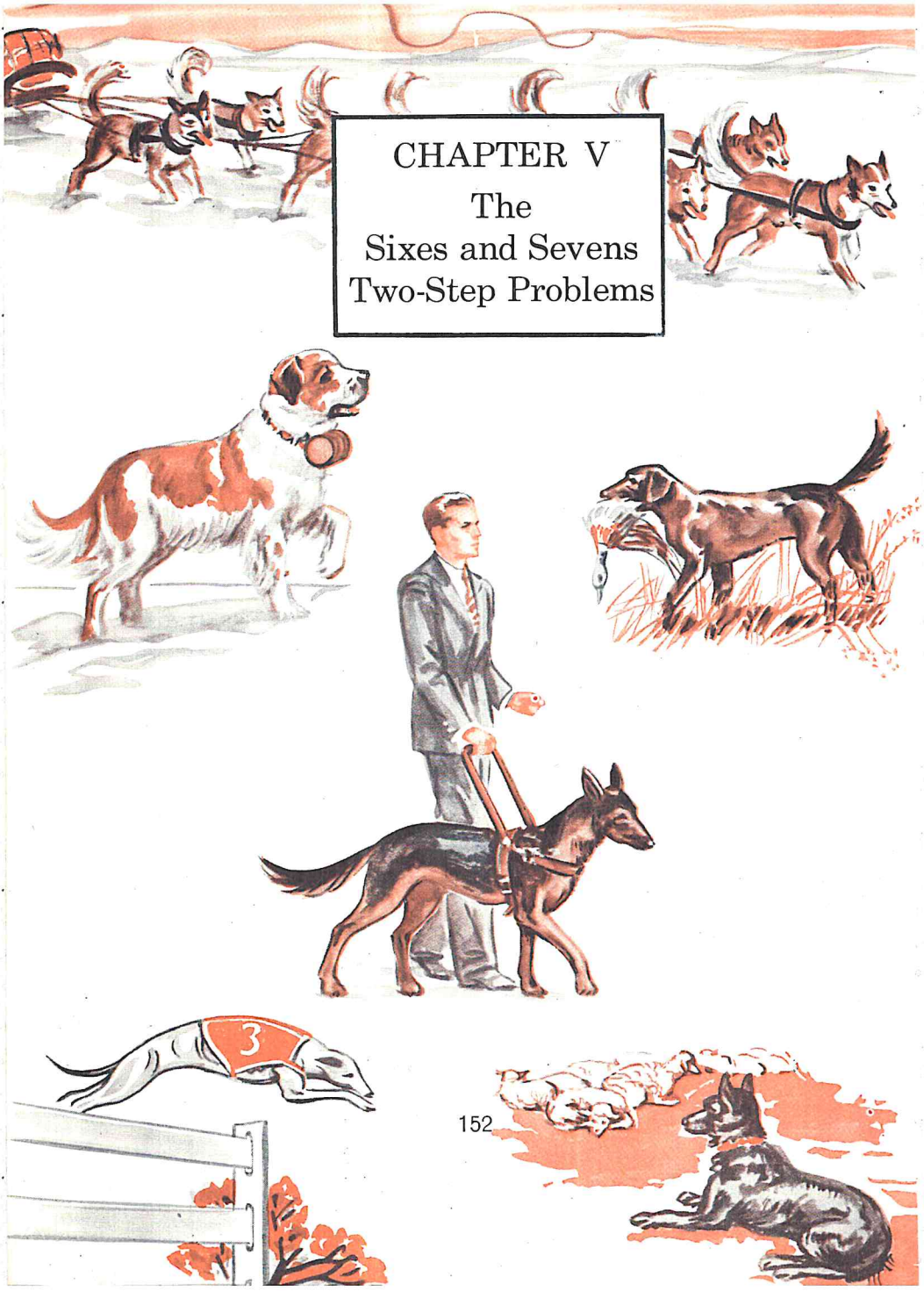
1. What do these words and phrases mean?

cent	dime	gallon	half pint
pt.	quart	month	magic square
foot	dozen	dollar	quart bottle
qt.	pint	nickel	quart brick
pair	yard	four fifths	liquid measure

2. Read these numbers. Tell what each means:
   1,400 3,040 5,004 7,014
3. Read these prices: \$17.30; \$8.02; \$165.10.
4. Read this sentence: The first kindergarten in this country was opened at Watertown, Wisconsin, in 1855.
5. How many pints are there in one quart?
6. How many quarts are there in one gallon?
7. You can make 10 different numbers with the three figures 1, 7, and 0. They are: 1, 7, 10, 17, 70, 71, 107, 170, 710, and 701. Make **twelve** different numbers with the figures 4, 5, and 6.
8. Write in figures with dollar signs and decimal points:
   a. Five dollars and four cents.
   b. Four cents.
   c. Eight dollars and twenty cents.
   d. Ten dollars and seven cents.
9. Find the sums:
   a. 438 + 69 + 3 = *b.* 8 + 703 + 74 =
10. Watch the signs.

a	*b*	*c*	*d*	*e*	*f*
5	5)87	5)540	700	\$4.30	70¢
×47			−294	+.85	×5





CHAPTER V
The Sixes and Sevens Two-Step Problems

DOGS THAT WORK

1. Shep is a faithful collie dog. He herds the sheep for his master. He guards a flock of 325 sheep and 68 lambs. How many animals does he guard?

2. Greyhound dogs are used for racing and jumping. King is a fine racing dog. He can leap over a 12-foot wall. Measure this distance with a ruler; with a yardstick.

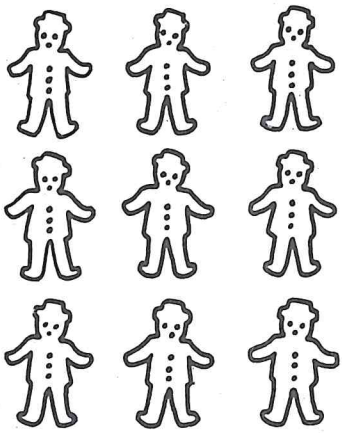
3. Lady is a Seeing-Eye dog. She is trained to lead her blind master. She has worked for her master for 9 months. How much less than a year is this?

4. Trixie is an acting dog. Last year she was in 235 shows. This year she has been in 197 shows. In how many shows has she acted during the two years?

5. Dinty is a bird dog. He goes hunting with his master. On one trip he and his master brought in 18 wild ducks and 3 wild geese. What was their total catch?

*6. Make up a problem about one other kind of working dog that you know about.

MULTIPLYING 6 BY A NUMBER



Mary helped her mother decorate gingerbread men for her party. She put 6 raisins on each gingerbread man. She decorated 9 men.

Add the 6's to find how many raisins she needed to decorate:

1 man?	4 men?	7 men?
2 men?	5 men?	8 men?
3 men?	6 men?	9 men?

Reading these numbers will help you count by sixes.

0 6 12 18 24 30 36 42 48 54

Count by 6's from 0 to 54; from 54 back to 0.

You know these: Write the reverse and its product for each.

$$\begin{array}{r} 6 \\ \times 2 \\ \hline 12 \end{array} \qquad \begin{array}{r} 6 \\ \times 3 \\ \hline 18 \end{array} \qquad \begin{array}{r} 6 \\ \times 4 \\ \hline 24 \end{array} \qquad \begin{array}{r} 6 \\ \times 5 \\ \hline 30 \end{array}$$

These are new. Study and learn them.

$$\begin{array}{r} 6 \\ \times 1 \\ \hline 6 \end{array} \qquad \begin{array}{r} 6 \\ \times 6 \\ \hline 36 \end{array} \qquad \begin{array}{r} 6 \\ \times 7 \\ \hline 42 \end{array} \qquad \begin{array}{r} 6 \\ \times 8 \\ \hline 48 \end{array} \qquad \begin{array}{r} 6 \\ \times 9 \\ \hline 54 \end{array}$$

Count by 6's to see if these products are correct.

I. Products to Name

6	6	6	6	6	6	6	6	6
3	7	2	8	5	1	4	9	6

6	6	6	6	6	6	6	6	6
5	9	1	4	7	2	8	6	3

Make a Practice card for each combination you need to study.

II. Problems to Read and Do

1. Dick's stamp book holds 6 stamps on each page. How many stamps must he have to fill 8 pages?

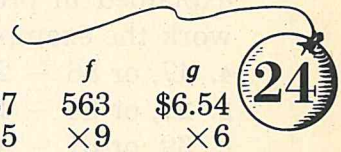
2. Grapefruit were 6¢ each. How much did Mother have to pay for 9 of them?

3. If a fourth-grade class orders 6 bottles of milk each day, how many bottles will they order in 5 days? in 4 days? in 7 days? in 6 days?

4. Ray made 2 toy airplanes for each of 6 classmates. How many airplanes did he make in all?

5. The postman walks 6 miles a day on his route. How many miles does he walk in a week of 6 days?

LET'S PRACTICE



	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	65	96¢	36	$.65	$8.67	563	$6.54
	×1	×5	×8	×7	×5	×9	×6
2.	46	65¢	36 cents	692	$6.45	916	$3.46
	×9	×2	×6	×3	×8	×4	×7

*THINKING AHEAD WITH NUMBERS

1. John went to the store with 85 cents. He bought a pound of cookies for 29 cents and some meat for 42 cents. Will he have any money left?

Think: 29 is about 3 tens.
42 is about 4 tens.
3 tens and 4 tens are 7 tens, or 70.
So John will have some money left.

2. Mary had 80 cents. She bought some bananas for 29 cents. Can she buy a jar of honey costing 40 cents?

Think: 8 tens less 3 tens is 5 tens, or 50.
So Mary can buy the jar of honey.

Copy the examples as they are written below, one at a time. Draw a line around the part that you think is larger. Use the method of thinking or **estimating** that is used in problem **1** above. Then work the example to see if your **estimate** was correct.

	a	*b*	*c*
1.	75, or 38 + 29.	48, or 29 + 11.	85, or 41 + 58.
2.	57, or 21 + 42.	62, or 32 + 45.	67, or 29 + 48.
3.	85, or 52 + 22.	78, or 33 + 29.	93, or 39 + 49.

Which part do you think is larger? Use the method explained in problem **2** to estimate the answer. Then work the example to see if your estimate was correct.

4.	47, or 86 − 21.	53, or 95 − 32.	36, or 78 − 25.
5.	27, or 53 − 14.	73, or 91 − 29.	23, or 69 − 48.
6.	39, or 61 − 42.	46, or 83 − 24.	59, or 99 − 31.

Which of these examples have an answer of more than 40?

7. 28 + 19. 8. 69 − 38. 9. 11 + 38. 10. 99 − 51.

MISSING FACTS IN MULTIPLICATION PROBLEMS

Before you can answer each of the questions below, what fact must you know?

1. How much did Mother pay for 3 quarts of milk?
2. How many desks are there in 4 equal rows?
3. How much must I pay for 4 pounds of sugar?
4. How many children are there on 3 equal teams?

These questions show that you must first know a fact about **one** before you can find out about **several.**

In question 1, the price of milk is **not always** the same. So, the problem must tell you **how much** Mother paid **for one** of **these** quarts before you can find out how much she paid for 3 quarts.

In question 2, the number of desks in a row is **not always** the same. So, the problem must tell you **how many** desks there are in **one** of **these** rows before you can find out how many desks there are in the 4 rows.

In question 3, the price of a pound of sugar is **not always** the same. So, the problem must tell you the price of **one** of **these** pounds of sugar before you can find out how much to pay for 4 pounds.

Read question 4. Tell why you could not work this problem unless the problem told you the number of children on **one team.**

In all these questions the value of one thing is not always the same. Such questions cannot be answered unless you can find in the problem the missing fact about one.

FINDING THE MISSING FACTS IN MULTIPLICATION PROBLEMS

In what way are the questions on this page like those on page 157? In what way are they different?

1. How many eggs are there in 2 dozen?
2. How many socks are there in 6 pairs?
3. How many cents are there in 3 nickels?
4. How many days are there in 4 weeks?

These questions are **like** those on page 157 because you must first know a fact about **one** of the things before you can find out about **several.** These questions are **not like** those on page 157 because the fact you must know about **one** of the things is **always the same.**

There are always 12 things in 1 dozen. How many things are always in 1 pair? How many cents are always in 1 nickel? How many days are always in 1 week?

In some problems the missing fact about one thing is always the same. If you know this fact, you can work the problem even if it does not tell you the value of one.

To work problems like those at the top of this page you will need to know the facts in the box below. Study these facts before you try to work the new problems on the next page. These facts will be missing in the problems. You will need to know them.

1 dozen (doz.)	**= 12 things**	**1 hour (hr.)**	**= 60 minutes (min.)**
1 pair (pr.)	**= 2 things**	**1 week (wk.)**	**= 7 days (da.)**
1 foot (ft.)	**= 12 inches (in.)**	**1 year (yr.)**	**= 12 months (mo.)**
1 yard (yd.)	**= 36 inches**	**1 nickel**	**= 5 cents**
1 yard	**= 3 feet**	**1 dime**	**= 10 cents**

WORKING PROBLEMS WITH MISSING FACTS

1. How many cookies are there in 3 dozen?

There is only one number fact given in this problem. Another fact which you need to know is missing. Before you can tell how many cookies there are in 3 dozen, you must know how many cookies there are in one dozen. The problem does not tell you this, but you know how many cookies there are in one dozen. The number of things in one dozen **is always the same.**

> **This is a problem in which a fact which you need in order to work the problem is not given. But you know this missing fact. Change the problem by putting in the missing fact. Then work the problem.**

Think: There are 12 cookies in one dozen. How many cookies are there in 3 dozen? You now have a multiplication problem.

$$\begin{array}{r} 12 \text{ cookies} \\ \times 3 \\ \hline 36 \text{ cookies} \end{array}$$

2. How many nickels are there in 20 cents?

Think: There are 5 cents in one nickel. How many nickels are there in 20 cents? You now have a problem in division. Tell how you know that this is a division problem. Work the problem.

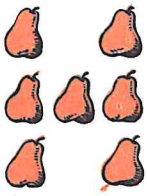
$$\begin{array}{r} 4 \\ 5\overline{)20} \end{array}$$

3. How many stockings are there in 8 pairs?
4. How many days are there in 3 weeks?
5. How many quarts are there in 6 pints of milk?
6. How many yards are there in 24 feet of rope?
7. How many cents are there in 4 nickels? in 4 dimes?

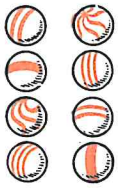
MULTIPLYING BY SIX

You know these: Write the reverse and its product for each.

2	3	4	5	6
×6	×6	×6	×6	×6
12	18	24	30	36



Picture 1



Picture 2

Picture 3

1. Draw 6 pictures like picture 1. Add the pears by sevens to see how many there are if you have six times 7 pears.

2. Draw 6 pictures like picture 2. Add to see how many marbles there are if you have six times 8 marbles.

3. Draw 6 pictures like picture 3. How many chocolate creams are six times 9 chocolate creams ?

These are new. Learn them.

0	1	7	8	9
×6	×6	×6	×6	×6
0	6	42	48	54

Count by 6's from 0 to 54; from 54 back to 0.

Products to Name

5	8	6	2	6	0	4	6	6	1
6	6	3	6	9	6	6	2	6	6
3	6	7	6	6	9	2	6	6	6
6	5	6	1	6	6	6	4	8	7

Make a Practice card for each combination you do not know well.

PRACTICE IN COLUMN ADDITION

Find these sums. Check each example.

1.	2.	3.	4.	5.	6.
$6.77	$8.89	568	43	129	$5.45
.67	7.78	99	9	75	4.66
5.89	8.06	878	975	778	5.76
		979	989	863	5.45

Problems to Read and Do

1. How much must your mother pay for 6 bars of soap at 6¢ a bar? 6 lb. of sugar at 8¢ a lb.? 6 cans of soup at 9¢ a can? 6 yd. of lace at 7¢ a yd.?

2. If there are 5 desks in a row, how many desks are there in 6 rows?

PRACTICE IN MULTIPLICATION

Set 1

	a	*b*	*c*
1. 4 ×	17	$.95	82¢
2. 5 ×	96	$.43	18¢
3. 6 ×	49	$.56	73¢
4. 6 ×	79	$.60	34¢

Set 2

	a	*b*	*c*
1. 4 ×	682	$4.75	976
2. 5 ×	712	$6.80	493
3. 6 ×	409	$2.35	687
4. 6 ×	914	$7.86	239

Set 3

	a	*b*	*c*
1. 4 ×	94	80 cents	36
2. 5 ×	57	20 cents	89
3. 6 ×	80	58 cents	91
4. 6 ×	81	65 cents	27

Set 4

	a	*b*	*c*
1. 4 ×	813	$9.00	345
2. 5 ×	520	$8.15	967
3. 6 ×	478	$6.51	150
4. 6 ×	923	$8.70	465

BIG TO LITTLE OR LITTLE TO BIG?

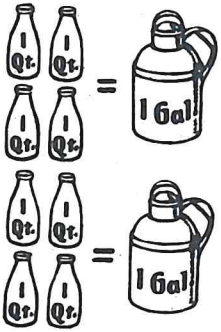
1. Our school lunch room used 8 gallons of milk one noon. How many quarts are there in 8 gallons?

a. Think: Which is the larger measure, quarts or gallons? A gallon pail will hold how many quarts?

b. To change from a gallon measure to quart measures you have 4 quart measures for each gallon measure. Because you have 4 quarts eight different times, you multiply 8×4 quarts $= 32$ quarts.

To change from big measures to little measures you multiply to get more small amounts. The smaller the size of the measure, the more of them there will be.

2. Another school lunch room used 8 quarts of milk at noon. How many gallons are there in 8 quarts?



a. Which is the larger measure, quarts or gallons? How many quart measures does it take to fill 1 gallon measure?

b. To change from quart measures to gallon measures you find how many 4's there are, because each gallon holds 4 quarts. Divide: $4\overline{)8}$. There are 2 gallons in 8 quarts.

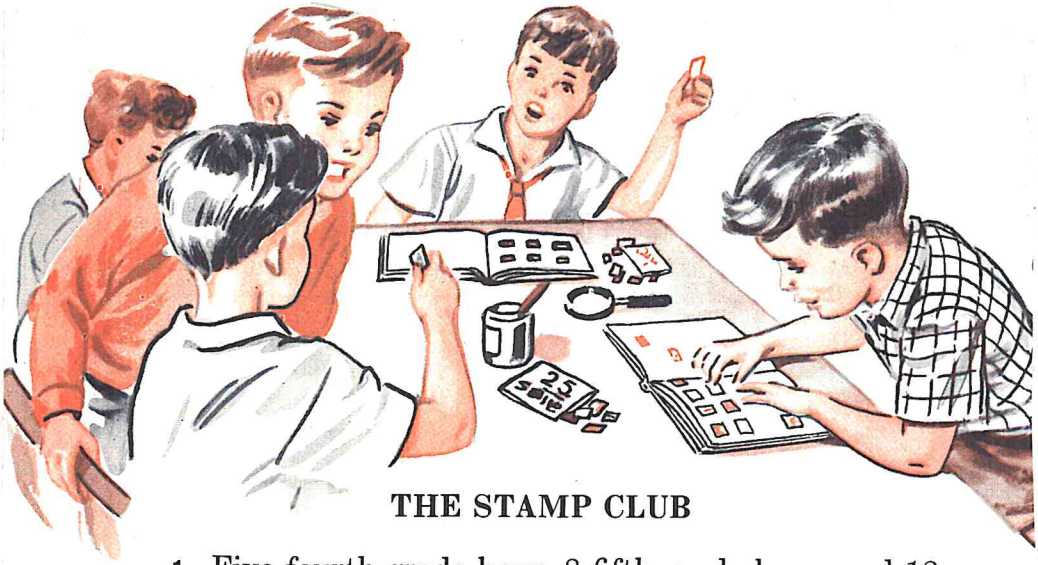
To change from little measures to big measures you divide to get fewer large amounts. The larger the size of the measure, the fewer of them there will be.

PRACTICE IN CHANGING MEASURES

Practice these study helps with each of the following problems. Use the facts you have learned about measures in working the problems.

Think: (1) Am I asked to change from a big measure to a little measure? Then I will multiply to get more units. (2) Am I asked to change from a little measure to a big measure? Then I will divide to get fewer units. (3) What fact is missing in each problem?

1. How many days are there in 5 weeks?
2. How many nickels are there in 35 cents?
3. How many minutes are there in 5 hours?
4. How many yards are there in 9 feet of string?
5. How many months are there in 5 years?
6. How many nickels can Joe get for 40 pennies?
7. Jane's room is 12 feet long. How many yards long is it? It is 15 feet wide. How many yards wide is it?
8. Mary visited her Aunt Martha for 4 weeks last summer. How many days did she visit?
9. Allen bought 4 pints of chocolate ice cream for the party. How many quarts of ice cream did he buy?
10. Peter's new sailboat is 2 feet long. How many inches long is it?
11. A hotel ordered 20 quarts of milk. How many gallons of milk was this?
12. Ann is exactly 6 years old. How many months old is she?



THE STAMP CLUB

1. Five fourth-grade boys, 8 fifth-grade boys, and 12 sixth-grade boys belong to the stamp club. How many members are there?

2. Roger has 280 stamps. Cliff has 273 stamps. How many more stamps has Roger than Cliff?

3. Wilbur bought 25 stamps at 6 cents apiece. How much did he pay for them?

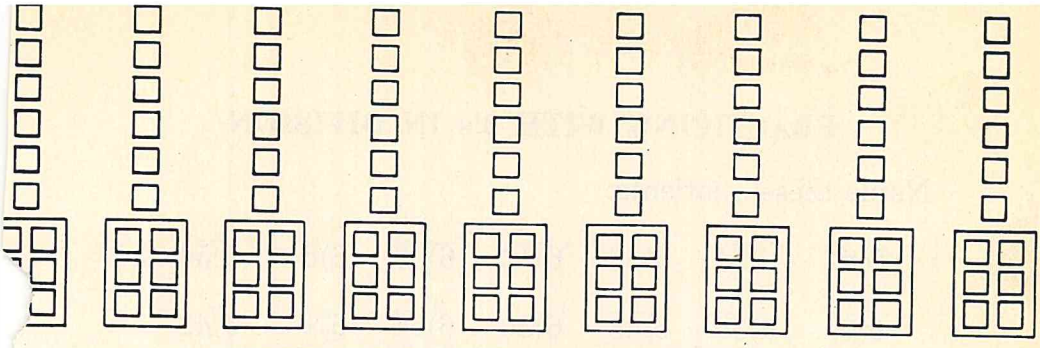
4. Harry bought 54 new stamps. If he pastes 6 of them on each page of his stamp album, how many pages can he fill?

LET'S PRACTICE

Find these remainders. Check each example.

25

	a	*b*	*c*	*d*	*e*
1.	$75.03	$47.86	$26.84	$657.58	$335.46
	6.34	38.07	26.79	8.59	298.79
2.	$354.64	$51.74	$935.33	$94.63	$200.32
	80.76	51.65	579.49	87.07	90.69



RICHARD'S NEW SNAPSHOT BOOK

Richard kept his snapshot pictures in a box until he bought a snapshot book. He could paste 6 snapshots on each page. He laid them out in rows of 6 snapshots each, as you see in the picture above.

1. How many pictures does Richard have in all?
2. How many pages can he fill with the first 2 rows of pictures?
3. Copy the chart below. Use the picture above to help you fill in the blanks.

Number of Pictures	Number of Pages	Division Fact	Number of Pictures	Number of Pages	Division Fact
0	0	$6\overline{)0}$ = 0	30	(?)	$6\overline{)30}$ = 5
6	1	$6\overline{)6}$ = 1	36	(?)	$6\overline{)36}$ = 6
12	2	$6\overline{)12}$ = 2	42	(?)	$6\overline{)42}$ = 7
18	(?)	$6\overline{)18}$ = 3	48	(?)	$6\overline{)48}$ = 8
24	(?)	$6\overline{)24}$ = 4	54	(?)	$6\overline{)54}$ = 9

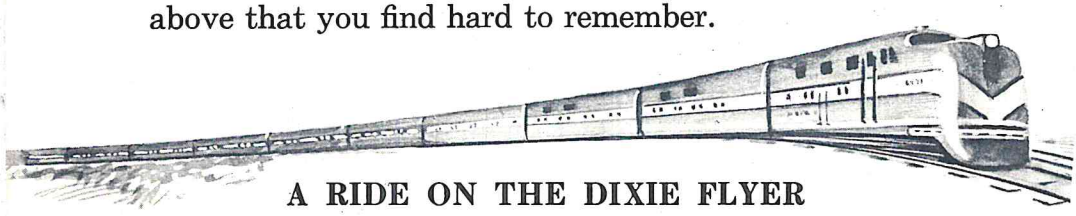
4. Count by 6's from 0 to 54; from 54 back to 0.

PRACTICING WITH 6's IN DIVISION

Name these quotients:

6)42	6)24	6)36	6)12	6)48	6)6	6)54
6)0	6)36	6)48	6)30	6)54	6)18	6)42

Make a Practice card for each division combination above that you find hard to remember.



A RIDE ON THE DIXIE FLYER

1. Harry rode on the Dixie Flyer. It went a distance of 480 miles in 6 hours. At this rate how many miles did it travel an hour?
2. Prove that this train went more than a mile a minute. Have you ever ridden a mile a minute? When?
3. If the Dixie Flyer had traveled 90 miles an hour, how far would it have gone in 6 hours?

LET'S PRACTICE

26

Find these quotients. Check each example.

	a	*b*	*c*	*d*	*e*	*f*
1.	6)60	6)$5.40	6)306	4)361	4)263	5)379
2.	5)95	6)$2.40	6)480	6)300	5)432	4)832
3.	4)57	6)$6.60	6)606	4)332	5)118	4)827

6 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B	C	D	E
0 6)**0**	1	2	3	4	5
1 6)**6**	7	8	9	10	11
2 6)**12**	13	14	?	?	?
3 6)**18**	19	20			
4 6)**24**	25	26			
5 6)**30**	31	32			
6 6)**36**	37	38			
7 6)**42**	43	44			
8 6)**48**	49	50			
9 6)**54**	55	56			

1. In an example like 6)114 you must think: 6)11. The even division table of 6's will help you to find the right quotient figure.

2. Study the chart at the left. It shows you that when you see 6)11, you must think back to 6)6, since 6)11 comes between 6)6 and 6)12. What other facts come between these two combinations? What number will you think back to when dividing each of these numbers by 6?

3. Copy the chart at the left and complete the rows A, B, C, D, and E for each division combination of 6.

4. Use the chart you have made to find out what number you should think back to when dividing each of the following numbers by **6**: 15, 28, 43, 50, 10, 57, 2, 41, 31, 23, 58, 17, 53, 45, 4, 37, 8, 35, 26, 55, 52, 47, 38, 33, 5, 13, 21, 29, 7, 19, 46, 16, 40, 51, 27, 3, 44, 53, 19, 33, 50, 32.

To Test: What numbers less than 60 when divided by 6 have a remainder of 1? of 2? of 3? of 4? of 5?

FIVE LESSONS IN DIVISION

Practice these examples on different days until you can work them without making any mistakes.

Set 1. Divide the following numbers by 2:

	a	*b*	*c*	*d*	*e*	*f*
1.	19	76	91	158	$1.90	$6.96
2.	412	217	135	137	$8.14	$1.16
3.	600	58	144	101	$2.12	$1.58

Set 2. Divide the following numbers by 3:

	a	*b*	*c*	*d*	*e*	*f*
1.	20	51	72	174	$8.37	$6.24
2.	915	314	253	280	$2.61	$1.95
3.	300	270	226	182	$2.91	$1.17

Set 3. Divide the following numbers by 4:

	a	*b*	*c*	*d*	*e*	*f*
1.	30	96	76	228	$6.12	$2.36
2.	820	433	146	275	$3.92	$2.96
3.	804	185	318	243	$9.52	$1.72

Set 4. Divide the following numbers by 5:

	a	*b*	*c*	*d*	*e*	*f*
1.	38	65	82	290	$7.60	$8.75
2.	535	363	525	348	$4.30	$2.45
3.	192	83	473	203	$4.90	$1.15

Set 5. Divide the following numbers by 6:

	a	*b*	*c*	*d*	*e*	*f*
1.	47	78	98	390	$7.56	$4.44
2.	642	634	389	169	$5.88	$9.12
3.	600	80	590	542	$5.58	$6.48

TONY'S NEW CLARINET

Hello, boys and girls! I am Tony. Here I am playing on my new clarinet.

1. Father bought me this fine second-hand clarinet for $9.25. If he paid for it with a ten-dollar bill, how much change did he receive?

2. I am going to try to earn the money to pay for my clarinet. If I earn the money in 5 months, what is the average, or equal, amount I must earn each month?

3. I pay 35 cents a lesson to join the clarinet class. How much will 5 lessons cost? 8 lessons?

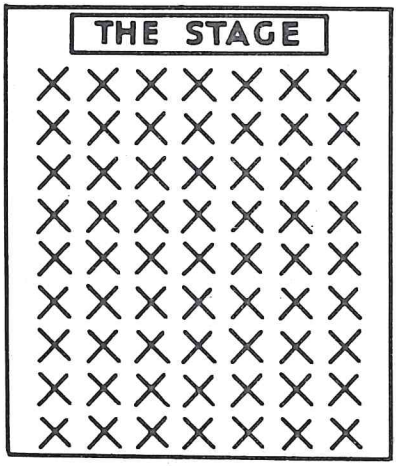
4. There are 25 boys and 18 girls in the school band. How many children are there in all?

5. How many more boys than girls are there?

LET'S PRACTICE

27

1.	5)92	6)$1.26	6)426	4)391	4)350	5)408
2.	6)180	5)$5.00	6)366	5)335	5)160	5)534
3.	4)418	5)$2.70	4)207	5)353	5)515	5)470



MULTIPLYING 7 BY A NUMBER

This picture shows how Peter arranged the chairs for the assembly program. He put 7 chairs in each row. The crosses in this diagram show you how he placed the chairs in 9 rows.

Add the 7's to show how many chairs he placed in 7 rows; in 8 rows; in 9 rows.

You know these: Write the reverse and its product for each.

$$\begin{array}{r} 7 \\ \times 2 \\ \hline 14 \end{array} \quad \begin{array}{r} 7 \\ \times 3 \\ \hline 21 \end{array} \quad \begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array} \quad \begin{array}{r} 7 \\ \times 5 \\ \hline 35 \end{array} \quad \begin{array}{r} 7 \\ \times 6 \\ \hline 42 \end{array}$$

These are new. Learn them.

$$\begin{array}{r} 7 \\ \times 1 \\ \hline 7 \end{array} \quad \begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array} \quad \begin{array}{r} 7 \\ \times 8 \\ \hline 56 \end{array} \quad \begin{array}{r} 7 \\ \times 9 \\ \hline 63 \end{array}$$

Count by 7's to prove that these products are correct.

Products to Name

$$\begin{array}{ccccccccc} 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 \\ \underline{5} & \underline{9} & \underline{2} & \underline{6} & \underline{1} & \underline{4} & \underline{8} & \underline{3} & \underline{7} \\ 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 \\ \underline{4} & \underline{2} & \underline{6} & \underline{9} & \underline{3} & \underline{7} & \underline{1} & \underline{5} & \underline{8} \end{array}$$

Make a Practice card for each combination you need to study.

PRACTICING WITH 7's

I. Problems to Read and Do

1. Fred spent his summer vacation with his Uncle Tom. How many days had he been away from home when he had visited his uncle 8 weeks? 9 weeks?

2. Chickens were selling at 27 cents a pound. How much did Mrs. Cook pay for a 7-pound chicken?

3. The boys of the Lincoln School are going to raise enough money to buy 7 new baseballs at $1.75 each. How much money must be raised to pay for them?

4. At a summer camp seven girls sleep in a cabin. How many girls are there in 9 cabins?

II. Let's Play Hopscotch

Can you hop on each square without making a mistake? Multiply the number 7 by each of the numbers in the hopscotch squares. Ready, GO!

3	8	7
9	5	1
6	2	4

LET'S PRACTICE

28

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	47	$.78	70¢	708	$7.90	475	75 cents
	×7	×6	×3	×5	×4	×9	×8
2.	67¢	$.75	57	967	$5.76	746	$6.97
	×9	×2	×1	×6	×7	×8	×5

EARNING MONEY TO BUY A COASTER WAGON

1. Otto saw a fine coaster wagon in a department store window. The price was $4.50. Otto hurried home to count the money in his savings bank. He had just $3.50. How much more money did Otto need before he could buy this coaster wagon?

2. Otto started to earn the money he needed. That week he earned $.10 for weeding the garden, $.25 for helping Mother, and $.05 for selling old papers. How much did he earn in all that week?

3. "I'll pay you 5 cents a day for taking care of the twins after school," said Otto's neighbor. Otto cared for the twins for 9 days. How much did he earn?

4. Otto earned 30 cents running errands at 5 cents each. How many errands did he run?

5. How much money did he earn in all in problems **2**, **3**, and **4**?

6. How much more money was this than Otto needed to buy the coaster wagon? (Use the answers to problems **1** and **5**.)

7. Here is Otto trying out his new wagon. How big it is! It is 40 inches long. How many inches more than a yard long is this?

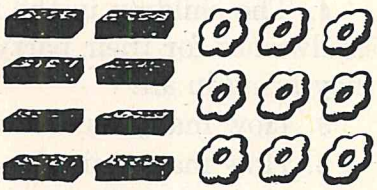
MULTIPLYING BY SEVEN

Write the reverse and its product for each.

2 × 7 = 14	3 × 7 = 21	4 × 7 = 28	5 × 7 = 35	6 × 7 = 42	7 × 7 = 49

1. Draw 7 pictures like picture 1. Add to see how many candy bars there are in all. Do you have seven times 8 bars?

2. Draw 7 pictures like picture 2. Count to see how many cookies seven times 9 are.



Picture 1 Picture 2

These are new. Learn them.

0 × 7 = 0	1 × 7 = 7	8 × 7 = 56	9 × 7 = 63

Count by 7's from 0 to 63; from 63 back to 0.

Products to Name

5	3	7	7	9	7	4	1	8	9
7	7	4	7	7	8	7	7	7	7
6	7	2	0	7	9	5	7	1	8
7	3	7	7	6	7	7	2	7	7
4	7	6	3	0	7	2	7	7	8
7	9	7	7	7	5	7	7	1	7

Make a Practice card for each combination you need to study.

PROBLEMS TO READ AND DO

1. At 35 cents a ticket, how much must Uncle Bob pay to take 7 children to the circus?

2. If Uncle Bob's ticket cost 50 cents, how much did he have to pay for all the tickets? (See problem 1 to find how much he paid for the children's tickets.)

3. How much did Joe pay for 7 eight-cent tops?

4. The children in the fourth grade brought 7 dozen sandwiches for their party. How many sandwiches did they bring in all?

5. How many days are there in 7 weeks?

6. How many minutes are there in 7 hours?

7. How many hours are there in 1 day? How many hours less than one day are 7 hours?

8. How many quarts are there in 7 gallons?

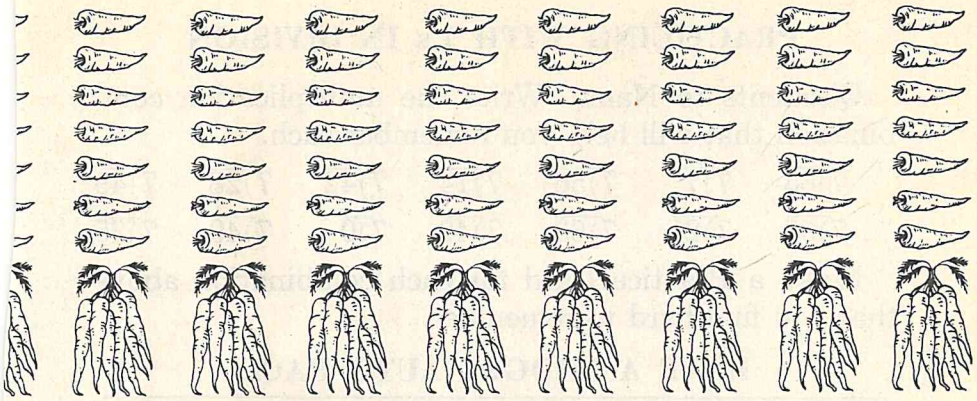
9. If there are 24 hours in one whole day, how many hours are there in one week of 7 days?

10. Alice had $1.05 in her bank. Today she put in $.07 more. How much money does she now have in her bank?

LET'S PRACTICE

29

Set 1	*a*	*b*	*c*	Set 2	*a*	*b*	*c*
1. 4 ×	78	69 cents	52	1. 5 ×	756	$8.00	194
2. 6 ×	49	12 cents	86	2. 6 ×	961	$6.18	708
3. 7 ×	78	90 cents	28	3. 7 ×	579	$8.10	249
4. 7 ×	57	14 cents	65	4. 7 ×	758	$9.08	361



CARROTS FOR CUSTOMERS

John laid out the carrots for his father to tie in bunches the way you see in the picture. 7

1. How many carrots did they put in each bunch? 3
2. How many carrots did John lay out in all? 6 3
3. How many carrots are in the first 2 rows? 14
4. How many bunches can they tie with 14 carrots? 2

Copy the chart below and fill in the blanks.

Number Carrots	Number Bunches	Division Fact	Number Carrots	Number Bunches	Division Fact
0	0	$7\overline{)0}$ = 0	35	5	$7\overline{)35}$ = 5
7	1	$7\overline{)7}$ = 1	42	(?)	$7\overline{)42}$ = 6
14	2	$7\overline{)14}$ = 2	49	(?)	$7\overline{)49}$ = 7
21	(?)	$7\overline{)21}$ = 3	56	(?)	$7\overline{)56}$ = 8
28	(?)	$7\overline{)28}$ = 4	63	(?)	$7\overline{)63}$ = 9

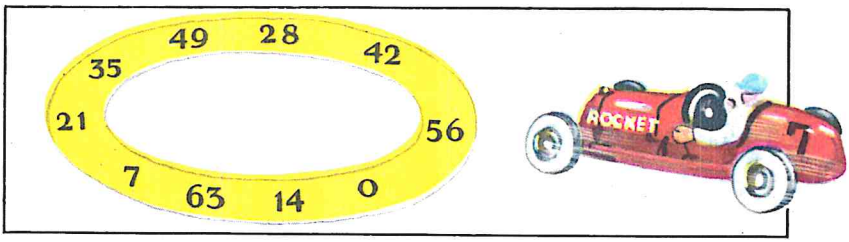
PRACTICING WITH 7's IN DIVISION

Quotients to Name. Write the multiplication combination that will help you remember each.

7)63	7)7	7)56	7)14	7)42	7)28	7)49
7)56	7)21	7)63	7)42	7)0	7)49	7)35

Make a Practice Card for each combination above that you find hard to remember.

HAVE A MIDGET AUTO RACE



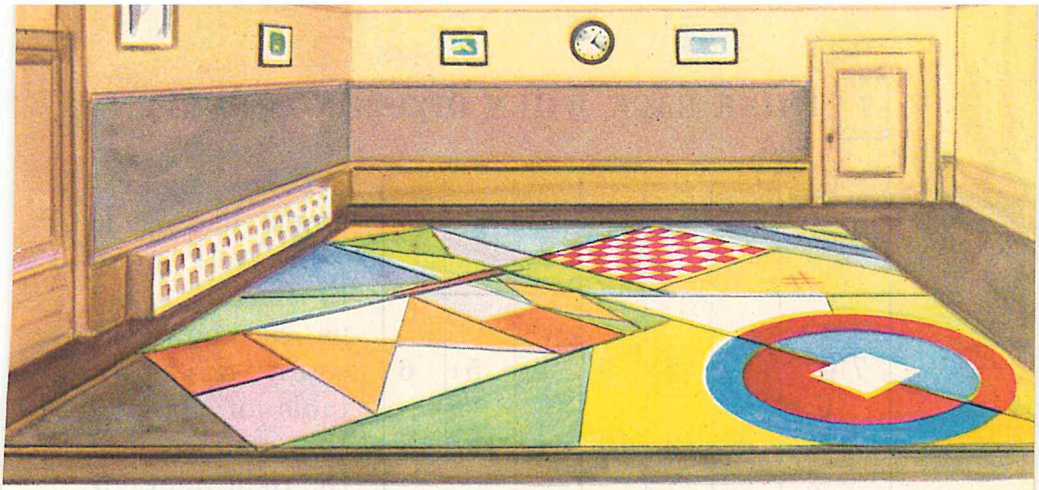
Choose a midget car and take turns racing around this number track by dividing each number on the track by 7. Have someone time you as you say the numbers. Whose car will win the race?

LET'S PRACTICE

Find these quotients. Check each example.

30

	a	*b*	*c*	*d*	*e*	*f*
1.	6)66	6)546	6)600	6)$3.60	6)$1.20	6)$4.86
2.	6)300	6)420	6)186	6)$1.80	6)$6.06	6)$2.46
3.	7)70	7)280	7)217	7)$3.50	7)$6.30	7)$7.00
4.	7)427	7)560	7)497	7)$5.67	7)$7.07	7)$1.47



DESIGNS IN A KINDERGARTEN FLOOR

The floor of this kindergarten room contains many different kinds of figures.

1. Point to a square on the floor. How can you tell that it is a square?
2. Draw a square that is $1\frac{3}{4}$ inches on a side.
3. Point to a triangle on the floor. What figure on the floor is made of four triangles?
4. On your paper draw a figure like the one made of four triangles.
5. What is the shape of the face of the clock?
6. What is the shape of the picture at the right of the clock? What is the difference between the shape of a square and of a rectangle?
7. Name some things in your classroom or elsewhere that are shaped like squares; like rectangles; like triangles; like circles.
8. What is the shape of the picture on the opposite page? Measure its length and width with a ruler.

7 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B	C	D	E	F
0 7)0	1	2	3	4	5	6
1 7)7	8	9	10	11	12	13
2 7)14	15	16	?	?	?	?
3 7)21	22	?				
4 7)28	29	?				
5 7)35	?	?				
6 7)42	?	?				
7 7)49	?	?				
8 7)56	?	?				
9 7)63	?	?				

1. In an example like 7)126 you will need to think 7)12. Let us see how the even division table of 7's will help you to find the right quotient figure in examples of this kind.

2. Study the chart at the left. It shows you that when you see 7)12, you must think back to 7)7, since 7)12 comes between 7)7 and 7)14.

3. Copy the chart at the left and fill in and complete all the numbers that belong in rows A, B, C, D, E, and F, for each of the division combinations of 7.

4. Use the chart you have made to find out what number you should think back to when dividing each of the following numbers by 7: 22; 37; 52; 11; 19; 62; 64; 44; 31; 4; 33; 50; 16; 24; 40; 69; 46; 58; 13; 5; 60; 66; 43; 54; 41; 57; 65; 45; 53; 34; 26; 39; 30; 20; 17; 8; 68; 3; 55; 59; 32; 25; 9; 48; 2; 36; 12; 15; 67; 10; 61; 18; 51; 23; 47.

FIVE LESSONS IN DIVISION

Practice these examples until you can work them without making any mistakes.

Set 1. Divide each of these numbers by 5:

	a	*b*	*c*	*d*	*e*	*f*
1.	38	70	86	190	$9.75	$2.60
2.	434	452	530	548	$4.15	$3.35
3.	246	89	293	514	$3.25	$7.30

Set 2. Divide each of these numbers by 6:

	a	*b*	*c*	*d*	*e*	*f*
1.	46	84	77	354	$3.78	$9.90
2.	287	484	636	650	$8.22	$4.32
3.	105	592	657	518	$5.64	$9.54

Set 3. Divide each of these numbers by 6:

	a	*b*	*c*	*d*	*e*	*f*
1.	53	600	78	99	$7.68	$5.82
2.	336	274	302	612	$2.34	$8.58
3.	649	555	485	644	$4.08	$9.24

Set 4. Divide each of these numbers by 7:

	a	*b*	*c*	*d*	*e*	*f*
1.	60	98	89	455	$6.51	$9.59
2.	470	565	428	763	$8.89	$5.95
3.	740	143	487	338	$5.18	$9.73

Set 5. Divide each of these numbers by 7:

	a	*b*	*c*	*d*	*e*	*f*
1.	53	84	96	420	$8.75	$6.16
2.	329	444	282	721	$6.86	$7.63
3.	741	346	318	755	$8.82	$3.99

HOW TO KNOW AND TO WORK A ONE-STEP PROBLEM

Irene is 9 years old. Her mother is 35 years old. How much older than Irene is her mother?

1. **Read the problem very carefully.** Try to picture the facts which are given.

2. **Find the problem question.**

How many years older than Irene is her mother?

3. **What two facts must we know before we can find the answer to this problem question?**

   a. How old is Irene.

   b. How old is her mother.

4. **Does the problem tell us these two facts?**

Yes. Irene is 9, and her mother is 35.

5. **Knowing these facts, what arithmetic process must we use to solve the problem?**

Subtract to find how much more one is than the other.

Read each of the following problems. First, ask yourself the above questions, and then solve the problem.

1. Tickets for the afternoon movie were 15 cents each. How much did Dan pay for 4 tickets?

2. Mary's father bought a 3-pound box of candy for $2.25. What did the candy cost a pound?

3. Jim had $4.95 in his bank. He received $1.75 for his birthday. How much money did Jim then have?

4. Harry had $15.00. If he spends $6.75 for a Flyer sled, how much money will he have left?

Because you took only one step in solving each of these problems, each is a one-step problem.

LIFE IN THE FAR NORTH

1. It is 6 miles from Sitka's winter home to the island on which his friend lives. If he can paddle in his kayak at the rate of 1 mile in 25 minutes, in how many minutes can he paddle from his home to the island?

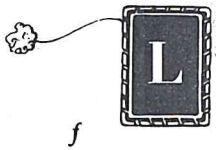
2. In Sitka's tribe of Eskimos there are 205 people. In another tribe there are 196 people. How many Eskimos are there in the two tribes?

3. How many more Eskimos are there in Sitka's tribe than there are in the second tribe?

4. When Sitka travels in winter, he must use a dog team. On one trip last winter he traveled 42 miles in 7 hours. How many miles an hour did he travel at this rate?

5. News came that a supply ship had landed at their trading post. Seventeen men, 9 women, and 18 children went to the trading post to see the boat. How many Eskimos in all went to see the supply ship?

LET'S SEE IF WE KNOW



+ Addition +

	a	*b*	*c*	*d*	*e*	*f*
1.	14 3	58 2	99 36	371 980	976 8	$7.12 .08
2.	7 9 3	5 0 7	4 4 9	9 8 7	35 82 96	$8.65 3.61 2.32
3.	597 521 147 104	76 89 73	$3.74 2.57	$ .67 8.52 7.79 4.00	$2.43 6.82 5.19 .01	9083 4110

— Subtraction —

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	87 32	93 86	61 9	90 15	862 248	806 374	$8.61 8.56
2.	961 68	700 31	$7.01 4.97	$5.07 3.19	$37.52 33.79	$75.24 29.69	$176.27 72.58

× Multiplication ×

		a	*b*	*c*	*d*	*e*	*f*	*g*
1.	**6 ×**	70	85	61	491	307	892	65¢
2.	**7 ×**	$.81	79¢	$6.45	$9.03	$8.61	$7.00	$4.25

÷ Division ÷

	a	*b*	*c*	*d*	*e*	*f*
1.	6)60	6)$6.30	7)$5.67	6)87	7)98	6)52
2.	6)375	7)$5.25	7)$7.42	6)586	7)273	6)500

WHAT FACTS MUST YOU KNOW?

In solving each of these problems, study the problem question carefully. Then think, "What two facts must I know to find the answer?"

One of the two facts you need to know is given in the problem. The other fact is in the box. Match the problem with the correct missing fact in the box.

1. You know how much Betty hands the clerk. What change did she receive?

2. Jane received 15¢ for each hour's work on Saturday. How much did she earn on Saturday?

3. Harry has read 24 pages of his story. How many pages has he yet to read?

4. You know how many children there are in your room. How many pupils are absent?

a. How many hours she worked.
b. How many are present today.
c. Total cost of purchases.
d. What it cost to make it.
e. What time it is due.
f. Cost of one yard.
g. Total number of pages.

5. Sam made a bird house. You know for how much he sold it. How much money did he make?

6. You know Ann bought 6 yards of ribbon. How much did she pay for this ribbon?

7. It is now 3:15. How long must we wait for the train to arrive?

*PAYING MORE FOR FASTER MAIL SERVICE

Beth Miller lives in Washington, D. C. She wanted to write to her grandmother in Chicago.

"What is the very fastest way to send a letter to Grandmother?" she asked her father.

"Air mail is faster, but costs more. If a letter weighs one ounce or less, it costs 3 cents to send it by train, and 5 cents to send it by air mail," said Father.

"Then let's send the air-mail letter," said Beth.

"When a letter is sent by train or by airplane, it stays in the post office until the postman starts his next regular trip. But, for 13 cents extra, you can buy a special delivery stamp. Then your letter to Grandmother will be delivered by a special delivery mailman as soon as it reaches the post office in Chicago," said Father.

1. Beth bought an air-mail stamp for 5 cents and a special delivery stamp for 13 cents and a post card for 1 cent. How much did she spend at the post office?

2. How much does it cost to send a letter, special delivery by train? Do you think a special delivery by train is faster than by air mail with regular delivery?

3. How much must you pay for 24 three-cent stamps? How much must you pay for 12 three-cent stamps?

4. Find the cost of air mail to China.

TELL WHAT FACTS ARE MISSING

Here are some problem questions. What two facts must you know before you can answer each question?

1. How much change should Dick receive?
   You must know (a) How much Dick spent.
   (b) How much he gave the clerk.
2. How many chairs were there in all of the rows?
3. How many cookies were left on the plate?
4. How much did both cost?
5. How much money did Mary have left?
6. How many little cakes can I buy with this money?
7. How many groups of children are there?
8. How many more valentines does Sue need to buy?
9. How much money did I pay for each balloon?
10. How much more than Carl did Tom earn?
11. How many children were there in each group?
12. How much more must I save before I can buy it?
13. What did he receive for all the balloons?
14. What did Father pay for the gasoline?
15. How many stamps are there in each row in a stamp book?
16. How much older than Jack is his father?
17. How many weeks will it take Jim to save this money?
18. George saved how much more than Sue saved?
19. How much did he receive for the tickets he sold?
20. How much change did Betty receive?
21. What was the price a gallon?
22. How many miles farther do they need to travel?

SOLVING PROBLEMS WITH TWO QUESTIONS

In each of the following problems there are two questions. Find the answer to question *a* first. Then find the answer to question *b*.

1. Henry picked 6 fine large melons from his garden. He gave 2 melons to his mother and sold the remaining melons to his neighbors at 8 cents apiece.
   a. How many melons did Henry have left to sell?
   b. How much did he receive for the melons he sold?
2. Russell bought a tablet for 5 cents and 2 pencils for 3 cents apiece.
   a. How much did the 2 pencils cost in all?
   b. How much did the tablet and the 2 pencils cost?
3. Irene bought a ball for 3 cents and jacks for 5 cents. She gave the clerk a dime.
   a. How much did she pay for the ball and jacks?
   b. How much change did she receive from a dime?
4. Bob had 15 cents. He bought 2 candy bars for 5 cents apiece.
   a. How much did the 2 candy bars cost?
   b. How much money did Bob have left?
5. In the fourth-grade hobby club there are 7 girls and 9 boys. The teacher has put them into groups of 4 children each, to plan a hobby program.
   a. How many children are there in the hobby club?
   b. How many groups of children will there be?

HOW TO FIND THE MISSING QUESTION

One day Miss Jackson gave the class this problem:

1. There were 3 girls and 2 boys playing in the back yard. Mother gave each child 2 cookies.

a. . . . . . .

b. How many cookies did Mother give them in all?

Miss Jackson said, "Question *a* is missing in this problem. Who can tell what question *a* should be?"

Henry said, "First I read the problem. Then I read question *b.* of the problem. I think, 'What two facts do I need to know to answer question *b*?' I need to know how many children there were in all, and I need to know how many cookies Mother gave each child. The problem did not tell me how many children there were in all. So I think the missing question *a* is, 'How many children were there in all?' " Is Henry right?

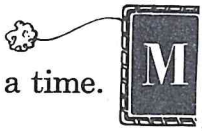
Here is a problem with question *a* missing in it. Find the answer to question *a*, then to question *b*. Work the problem.

2. Arthur ran 4 errands at 5 cents each. With this money he bought new marble shooters at 2 cents each.

a. . . . . . .

b. How many 2-cent marble shooters can he buy?

LET'S SEE IF WE KNOW HOW



Work the examples on this page one group at a time.

Addition

	a	*b*	*c*	
1.	33	57	3	**(13)**
	69	86	47	
	102			

	a	*b*	*c*	
4.	68	89	4	**(101)**
	87	5	59	
	76	95	75	
		49	85	

2.	809	650	289	**(13)**
	907	878	868	
3.	716	648	8	**(13)**
	99	52	396	

5.	$7.76	$3.65	$5.28	**(104)**
	3.45	8.19	.33	
	4.98	4.77	6.45	
		5.99	.06	

6. What is the sum of $3.69 + $.33 + $14.51 + $1.43? **(104)**

Subtraction

	a	*b*	*c*	
1.	137	106	155	**(19)**
	46	70	95	
2.	917	867	439	**(19)**
	264	380	355	
3.	781	395	862	**(19)**
	524	307	738	
4.	905	714	647	**(19)**
	396	276	568	

	a	*b*	*c*	
5.	882	406	567	**(19)**
	99	7	9	
6.	900	700	500	**(48)**
	149	696	38	
7.	$8.05	$3.06	$2.94	**(107)**
	7.28	.19	2.88	
8.	$41.40	$38.54	$703.23	**(107)**
	40.50	.49	67.69	

If you have difficulty, turn to the page given at the right of each group of examples.

SOLVING TWO-STEP PROBLEMS

Teddy bought an eraser for 2 cents and a pencil for 5 cents. He gave the clerk a dime. What change should the clerk give him?

1. Find and read the problem question.
2. Ask yourself: "What two facts must I know before I can answer the problem question?"
3. Does the problem tell these two facts? Which fact is missing? Make up a question to help you find this missing fact: **How much did Teddy spend for both the eraser and the pencil?**
4. Work the missing question first:

$$\begin{array}{r} 2 \text{ cents} \\ +5 \text{ cents} \\ \hline 7 \text{ cents} \end{array}$$

Teddy paid 7 cents for both the eraser and the pencil.

5. Work the problem question last:

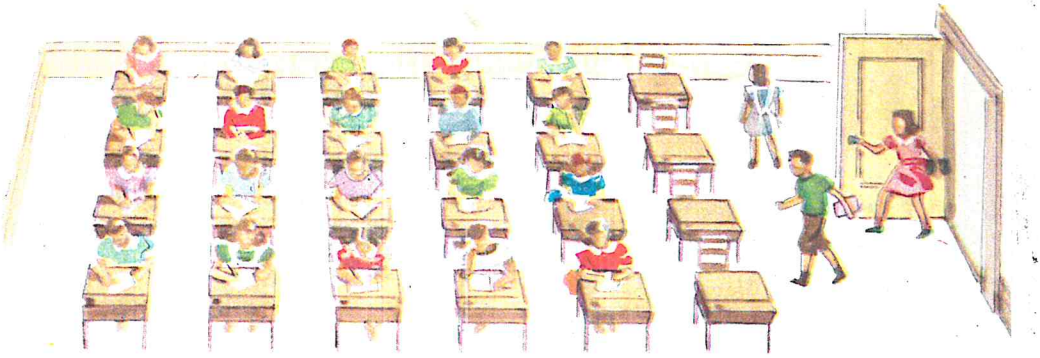
$$\begin{array}{r} 10 \text{ cents} \\ -7 \text{ cents} \\ \hline 3 \text{ cents} \end{array}$$

The clerk gave Teddy 3 cents change.

This is a two-step problem because you must work two problems to find the answer. First you answer a missing question. Then you answer the problem question.

Tell why the following are two-step problems.

1. Jane bought 2 yards of red ribbon and 4 yards of blue ribbon. The ribbon cost 3 cents a yard. How much did she pay for the ribbon?
2. Tony picked 5 bouquets of flowers. He gave 2 of them to his mother and sold the others at 5 cents each. How much did he receive for those he sold?



TWO-STEP PROBLEMS TO READ AND DO

1. When school began one stormy morning, there were 4 children in each of the 5 rows of the fourth grade. Three children came in late. How many children were in the fourth grade that stormy morning?

2. On an arithmetic test Robert worked 6 examples. Peter worked 2 examples more than Robert. How many examples did both boys work in all?

3. Mother gave each child 2 white cookies and 1 brown cookie. How many cookies did she give to 4 children?

4. Jimmie had 12 marbles. On his way to school he lost 3 of them. That night after school he bought 6 new marbles. How many marbles had he then in all?

5. Don and Dick took an arithmetic test. Don finished 10 examples, but he made mistakes in 3 examples. Dick worked only 8 examples, but they were all correct. How many more examples did Dick work correctly than Don worked correctly?

6. If Paul bought a box of 6 pencils for 30 cents, how much did 4 of these pencils cost?

7. Roy, Dick, and Eliot earned 30 cents shoveling the snow from Mrs. Brown's walk. The three boys divided the money equally among themselves. How many marbles at 2 cents each can Roy buy with his share of the money?

8. In a schoolroom there were 15 chairs placed in 3 equal rows. Two more chairs were added to the first row. How many chairs were there then in the first row?

9. Roy and Mike had a lemonade stand. They sold 12 glasses of lemonade at 5 cents a glass. Then the two boys divided the money equally. How much did each boy receive as his share?

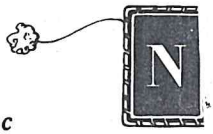
10. There were 12 children at Nancy's party. Four of the children went home early. After that, all the children who remained played a game in which they were divided into 2 equal groups. How many children were there in each group?

LET'S PRACTICE

31

		a	*b*	*c*			*a*	*b*	*c*
1.	4 ×	30¢	94	$.15	5.	5 ×	$6.14	579	$3.82
2.	6 ×	71¢	39	$.50	6.	6 ×	$3.45	789	$2.50
3.	7 ×	13¢	69	$.45	7.	7 ×	$6.43	769	$1.28
4.	7 ×	80¢	97	$.61	8.	7 ×	$2.00	457	$6.13

LET'S SEE IF WE KNOW HOW



Multiplication

	a	*b*	*c*			*a*	*b*	*c*	
1.	70	69	28	**(28)**	4.	489	285	875	**(81)**
	5	6	7			7	6	4	
2.	961	450	591	**(79)**	5.	$.90	17¢	16 cents	**(116)**
	5	6	7			4	7	4	
3.	713	607	408	**(80)**	6.	$3.25	$3.24	$6.45	**(117)**
	6	7	5			5	4	7	

Division

	a	*b*	*c*			*a*	*b*	*c*	
1.	3)93	4)80	2)48	**(59)**	3.	6)84	7)98	5)80	**(61)**
2.	6)34	7)53	5)47	**(59)**	4.	5)93	6)77	7)95	**(66)**

	a	*b*	*c*	*d*	
5.	4)168	3)276	2)160	5)205	**(90)**
6.	5)375	6)234	7)182	4)304	**(90)**
7.	6)458	7)407	4)343	5)184	**(90)**
8.	6)642	4)836	7)763	3)921	**(98)**
9.	4)415	2)613	7)730	6)650	**(118)**
10.	7)495	6)845	5)453	4)960	**(119)**
11.	7)$8.96	6)$9.06	5)$6.35	4)$4.32	**(140)**
12.	7)$6.65	7)$4.41	6)$5.76	6)$2.58	**(142)**

If you have difficulty with any example, turn to the page number at the right of that group for help.

*MORE TWO-STEP PROBLEMS TO SOLVE

Use the helps you learned on page 189 in solving the following two-step problems.

1. Billy had 6 white mice. He kept 2 of them and sold the others at 5 cents each. How much did he receive for those he sold?

2. Rose had 15 cents. She bought 2 chocolate bars for 5 cents apiece. How much money did she have left?

3. Jerry bought a box of crayons for 8 cents and 2 pencils at 3 cents each. How much did he spend for all these school supplies?

4. Robert bought 2 small valentines for 6 cents and a large valentine for 5 cents. How much more than the cost of one small valentine was the cost of one large one?

5. Marion bought 2 yards of blue ribbon and 3 yards of red ribbon. The ribbon cost 6 cents a yard. How much did she pay for the ribbon?

6. Howard sells radishes at 2 cents a bunch. One day he sold 10 bunches. How many 4-cent pencils could he buy with this money?

7. In the fourth-grade program 8 girls and 8 boys will dance. They will dance in groups of fours. How many groups of fours will there be?

HOW TO COMPARE THINGS

1. The picture shows that Peter has 4 times as much candy as Dick has. This is true because 4 pieces are 4 times as much as 1 piece.

Peter's candy

Dick's candy

Compare the pairs of things below.

2.

Tony's box

John's box

3.

Betty's ribbon

Ann's ribbon

4.

Joe's glass

George's glass

Using Fractions to Compare Things

1. We can say that Guy's stick is half ($\frac{1}{2}$) as long as Fred's stick. Can you tell why this is true?

Fred's stick

Guy's stick

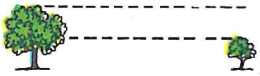
You see that we can use fractions to compare things. Use fractions to compare the pairs of objects below. Make up a sentence to tell the comparison.

2.

Grace's pencil

Patty's pencil

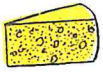
3.



Tree 1 Tree 2

4.

Nancy's cake



Sue's cake

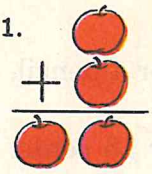
5.

Don's sled

Harry's sled

MOVING PICTURES OF EVERYDAY FRACTIONS

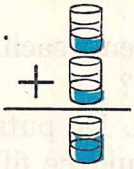
1. John has an apple. 1 apple



John buys an apple. +1 apple

John now has 2 apples. 2 apples.

2. John has a third of a glass of milk. $\frac{1}{3}$



He poured another third. $+\frac{1}{3}$

John now has 2 thirds. $\frac{2}{3}$

3. Mother cut a pie into fourths.

Here is the fourth she gave me. $\frac{1}{4}$

Here is another fourth I took. $\frac{1}{4}$

Here are the two fourths I now have. $\frac{2}{4}$

Do $\frac{2}{4}$ make $\frac{1}{2}$?

4. _____ Here is a line $\frac{1}{2}$ inch long. 1 half $\frac{1}{2}$

_____ Here is another line $\frac{1}{2}$ inch long 1 half $\frac{1}{2}$

_____ I put them together. 2 halves $\frac{2}{2}$

I have or

_____ a line 1 inch long. 1 whole inch.

5. Draw pictures to help you find the answers to these examples.

one third + one third = ? one half + one half = ?

one fourth + three fourths = ?

one fourth + two fourths = ?

MEASURING YOUR GROWTH IN PROBLEM SOLVING V

1. David had 21 cents. He spent 5 cents for a pencil. How many cents did he then have?

2. Jane had 27 cents. Her father gave her 15 cents. How much money did she then have?

3. Find the cost of 5 spelling tablets at 15 cents each.

4. How many nickels are there in 40 cents?

5. Fred has 42 stamps for his stamp book. He puts 6 stamps on each page. How many pages could he fill with the stamps he has?

6. Otto is 9 years old. His father is 44 years old. How much younger than his father is Otto?

7. On a three-day automobile trip Ann and her parents rode 275 miles the first day, 140 miles the second day, and 223 miles the third day. How many miles did they ride in the three days?

8. One day Mr. Smith's hens laid 6 dozen eggs. How many eggs did they lay in all that day?

9. Harry had a half dollar. He paid 10 cents for a ride on the bus. How much change should he receive?

10. Betty left home at 9 o'clock in the morning to visit her grandmother. She returned home at 6 o'clock. How many hours was she away from home?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

ACROSS THE BRIDGE TO THE NEW CHAPTER

1. Tell what these mean:

two-step problem	air-mail stamp	hour
one-step problem	special delivery stamp	year
problem question	minutes	month
fractions	comparing lengths	week

2. Which is larger? (Use estimates. Then work each example to see if your estimate was correct.)
   a. 95, or 48 + 39; 58, or 39 + 11; 85, or 41 + 39.
   b. 37, or 76 − 22; 52, or 94 − 31; 37, or 69 − 39.
3. What two facts must you know to answer each question below?
   a. How much money did both children have?
   b. How much change did Jane receive?
   c. How many children were there in each group?
4. Compare the pairs of things you see below:

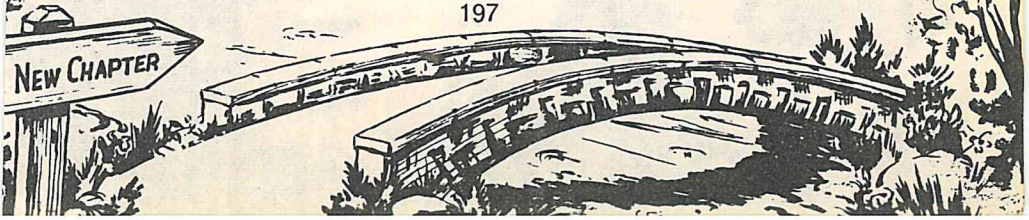
a. **Sue's ribbon**

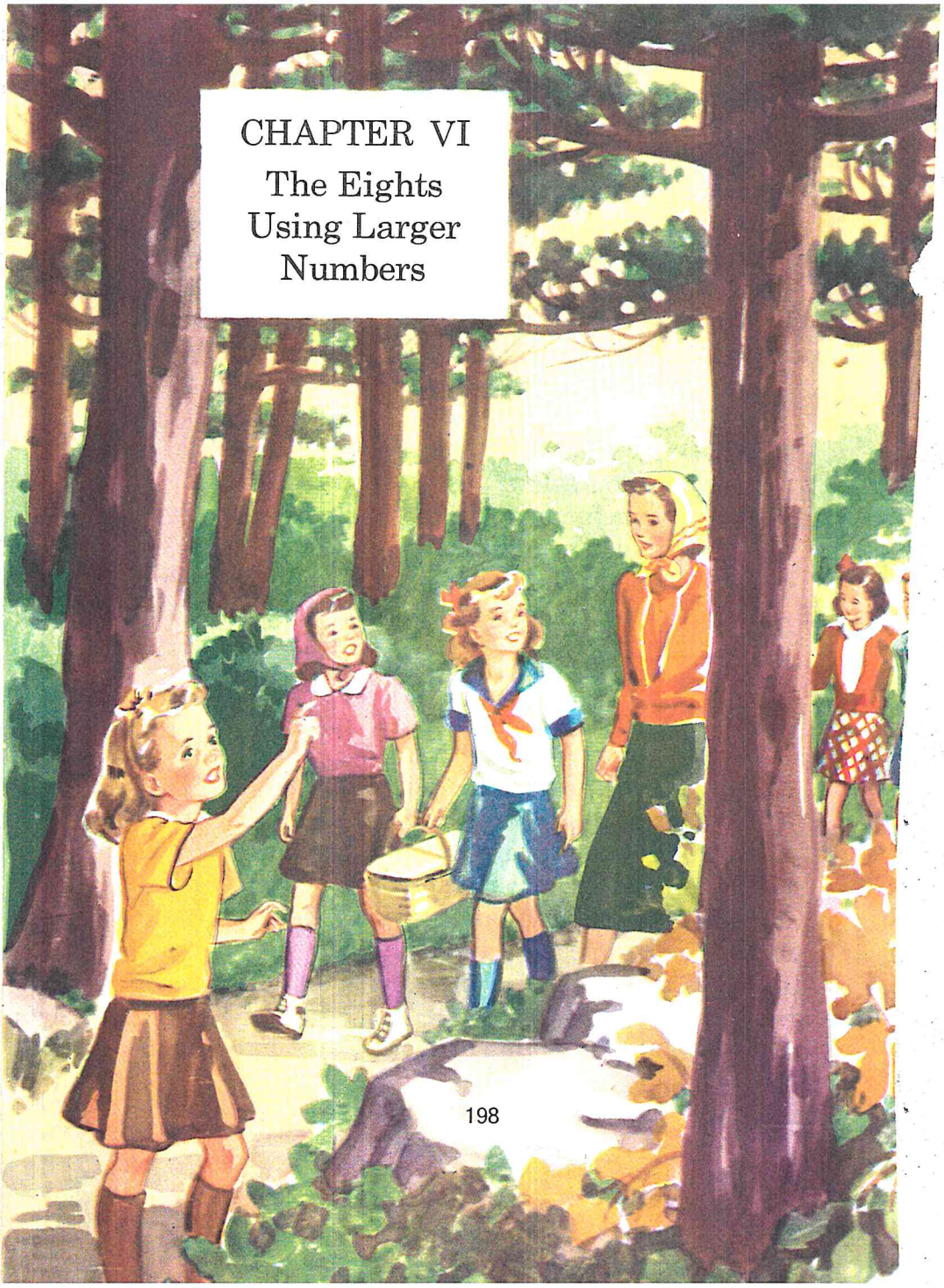
Ann's ribbon

b.

Joe's box **Ted's box**

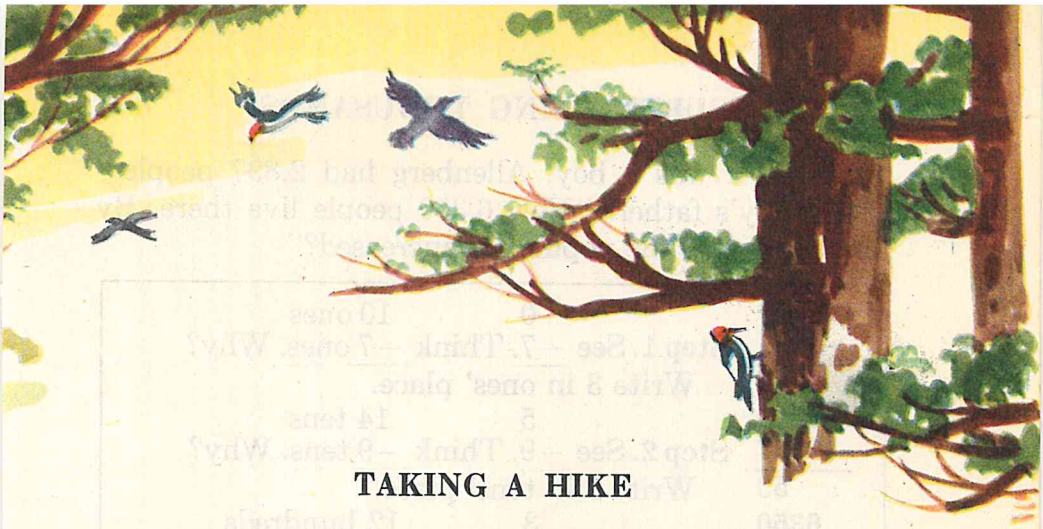
5. How many pints are there in 5 quarts?
6. How many quarts are there in 12 pints?
7. How many quarts are there in 5 gallons?
8. How many gallons are there in 8 quarts?
9. How many minutes are there in 5 hours?
10. How many nickels are there in 30 cents?
11. Draw a picture of a pie. Cut it into fourths to show that $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$.
12. Draw another picture of a pie. Cut it into fourths to show $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$, or $\frac{1}{2}$.





CHAPTER VI

The Eights Using Larger Numbers



TAKING A HIKE

A group of girls went on a hike with their teacher one Saturday morning.

1. The girls left the school at 8 o'clock and returned at 1 o'clock. How long were they on the hike?

2. In all they walked about 10 miles. How many miles an hour did they walk on the average?

3. On the way they saw 18 crows, 24 robins, 8 woodpeckers, 27 blackbirds, and 9 wild ducks. How many birds did they see in all?

4. For lunch they bought 5 quarts of milk at 9 cents a quart, some bananas for 24 cents, and some cookies for 28 cents. How much did they spend for the lunch?

5. The teacher bought 3 dozen eggs at a farmhouse at 37 cents a dozen. How much did she pay for them?

6. She gave the farmer a $5 bill. How much change should she have received?

7. The farmer had many baby chicks. He said that he had set hens on 144 eggs and that 128 chicks had hatched. How many did not hatch?

SUBTRACTING THOUSANDS

"When I was a boy, Allenberg had 2,897 people," said Betty's father. "Now 6,350 people live there. By how many has the population increased?"

6350	0	10 ones
−2897	**Step 1.** See −7. Think −7 ones. Why?	
3	Write 3 in ones' place.	
6350	5	14 tens
−2897	**Step 2.** See −9. Think −9 tens. Why?	
53	Write 5 in tens' place.	
6350	3	12 hundreds
−2897	**Step 3.** See −8. Think −8 hundreds. Why?	
453	Write 4 in hundreds' place.	
6350	6	5 thousands
−2897	**Step 4.** See −2. Think −2 thousands. Why?	
3453	Write 3 in thousands' place.	

Explain these examples. Name the missing numbers.

a. 8763	4392	7585	*b.* 9547	8106
−3864	−2888	−5967	−6278	−7774
4899	1504	1618	3?6?	?32

The first example in each row is worked correctly. Explain it before you subtract the others. Check.

	a	*b*	*c*	*d*	*e*
1.	9486	2867	6594	3759	9876
	5225	1563	2404	3657	3724
	4261				
2.	9653	4585	8671	2782	7794
	4315	3326	4165	2607	5158
	5338				

LET'S PRACTICE SUBTRACTION

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The first example in each row is worked correctly. Study it before you work the others. Check.

	a	*b*	*c*	*d*	*e*
1.	8350	8360	4560	9350	7570
	5633	4908	3851	6806	2959
	2717				
2.	8027	5019	6066	8023	8045
	3440	2681	3180	7361	1750
	4587				
3.	2504	8701	9202	3101	9604
	2427	7053	2088	3097	5106
	77				
4.	13521	17842	14963	17531	17518
	5696	7895	7994	8994	9599
	7825				

Problems to Read and Do

1. Tom has read 4 books. Jim has read 2 books more than Tom. How many books have both boys read?

2. Tony earned a dime. He spent 4 cents for a marble bag. How many two-cent marble shooters can he buy with the money he has left?

3. Two girls and four boys want to play a game. If they need two equal teams for this game, how many children must there be on each team?

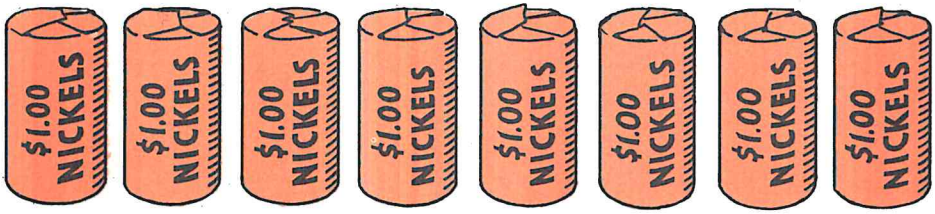
4. Jane had 6 pieces of candy. She gave half of them to her little brother. He ate 2 of his pieces of candy. How many pieces did he have left?

HOW HARRY COUNTED COINS

Harry is wrapping the nickels the fourth-grade children earned selling ice-cream bars. He wraps 20 nickels in each bundle. Then he will take the money to the bank. When he has wrapped one bundle, what is its value?

Find the value of the coins in one bundle by counting the money by 5's. Next find the value of one bundle by thinking 20 × 5 cents. Which way is shorter?

Here are the bundles of coins Harry wrapped:



Count by 20's to see how many coins there were. How many nickels were left over? How many nickels were there in all? Count the piles by 1's to count the dollars.

Our system of numbers uses only these ten figures:

0 1 2 3 4 5 6 7 8 9

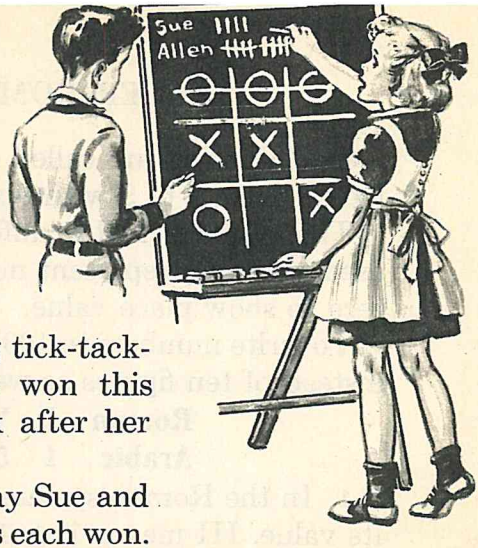
You know that 0 is a place holder. Show how it is possible to use 2 and 0 and make the following numbers:

0 2 20 200 2000 202 222

220 22 2200 2202 2002 2220

WHO WON?

Sue	I I I I
Allen	~~IIII~~ ~~IIII~~



Sue and Allen were playing tick-tack-too. Sue had the O's. She won this game and put another mark after her name.

The picture shows the way Sue and Allen kept track of the games each won.

When Sue had won 4 games, her score looked like this: Sue I I I I

When she won another game, she drew a line through the 4 markers like this ~~IIII~~ to show 5 games won.

1. How many games has Allen won?

2. Show how Sue's score would look after she had won 12 games; 16 games; 20 games.

When we keep a record or count as Sue and Allen did, we say we **tally.** Long ago people kept track of the number of sheep they had, or the number of prisoners they captured, by the **tally** method.

3. Why are tally marks in 5's easier to count than in 4's or 6's?

*4. Hold a class election and "**tally**" the vote.

*5. If your school is on a busy street or highway, tally the cars that go by in a 5-minute period.

*6. Is tallying the same as multiplying?

LARGER ROMAN NUMERALS

Our numbers are called **Arabic** numbers. We use the figures from 1 to 9 with 0 as a place holder.

The Romans had a different number system. They used letters to represent numbers, but they did not use zero to show place value.

To write numbers to 100 the Romans used five letters instead of ten figures as we do.

Roman	**I**	**V**	**X**	**L**	**C**
Arabic	**1**	**5**	**10**	**50**	**100**

1. In the Roman system, repeating a number repeats its value. III means 1 + 1 + 1 = 3. XX means 10 + 10 = 20. Tell what these numbers mean: II, XXX, CCC. The letters V and L are never repeated.

2. When letters are written together and the one of greater value comes first, we know the values are added. VI means 5 + 1 = 6. Tell what these numbers mean: XV, XXVIII, LXX, LV, XXXI, LX, VI.

3. When two letters are written together and the one of lesser value comes first, the value of the lesser is subtracted from the greater. IX means 10 − 1 = 9. Tell what these numbers mean: IV, XL, XC.

4. Write these Roman numerals in order from 10 to 100: XX, XL, XXX, LX, X, LXXX, C, L, LXX, XC.

5. Write in Roman numerals: 12, 17, 22, 45, 78.

6. Write in Arabic numerals: XXIV, XLV, XCIV.

7. In the number XXX what does the X stand for?

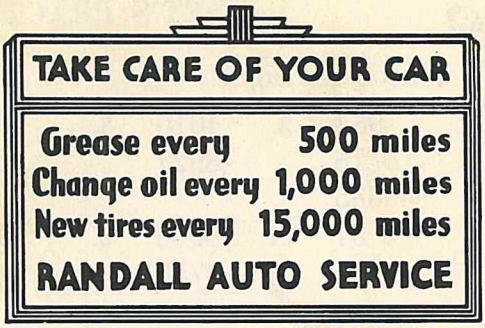
8. In the number 444 what does each 4 stand for?

9. Which number system do you think is the simpler? Why?

THOUSANDS ON A SIGN

John and his father saw this sign in a filling station.

The chart below will help you to read the numbers on it.



5,000 is read five thousand.
25,000 is read twenty-five thousand.
125,000 is read one hundred twenty-five thousand.
125,700 is read one hundred twenty-five thousand seven hundred.
125,070 is read one hundred twenty-five thousand seventy.
125,007 is read one hundred twenty-five thousand seven.

1. Father said, "It is time to buy new tires for our car. The speedometer shows that it has gone eighteen thousand miles." Write this amount in figures.

2. At what figure on the speedometer will the car get its next greasing?

Read these columns of numbers from top to bottom.

4,000	6,000	2,000	7,000	3,000
34,000	76,000	82,000	57,000	13,000
134,000	376,000	782,000	257,000	913,000
134,762	376,804	782,650	257,006	913,800
134,509	376,008	782,102	257,060	913,080
134,590	376,080	782,012	257,600	913,008

LET'S PRACTICE

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Watch the signs.

1. $\begin{array}{r} 984 \\ 76 \\ 685 \\ \underline{37} \end{array}$

2. $\begin{array}{r} 4010 \\ \underline{-3927} \end{array}$

3. $\begin{array}{r} 964 \\ \underline{\times 3} \end{array}$

4. $4\overline{)988}$

5. $\begin{array}{r} 8000 \\ \underline{-3756} \end{array}$

6. $\begin{array}{r} 679 \\ \underline{\times 5} \end{array}$

7. $5\overline{)480}$

8. $\begin{array}{r} 928 \\ \underline{\times 4} \end{array}$

9. $4\overline{)203}$

10. $\begin{array}{r} 6893 \\ \underline{-2794} \end{array}$

11. $\begin{array}{r} 698 \\ \underline{\times 6} \end{array}$

12. $\begin{array}{r} 8005 \\ \underline{-2037} \end{array}$

13. $\begin{array}{r} 589 \\ \underline{\times 7} \end{array}$

14. $\$7.64 + 9.87 + \$.30 + \$.75 =$

*A LONG-DISTANCE CALL

David Wilson lives in Chicago. He is visiting his Aunt Jane in another city. Today is his birthday.

"Let's call up David and wish him a happy birthday," said Patsy.

1. Father said, "Shall we call him now, or wait until after 7:00 o'clock? The night rate is cheaper than the day rate." Tell why.

2. Father said, "If we call Aunt Jane's telephone number and talk to anyone who answers, it is a **station to station call.** We must pay for the call even though David is not there. If we put in a call for David Wilson at Aunt Jane's number, it is a **person to person call.** We do not have to pay for the call unless David is there to talk to us. A station to station call is cheaper than a person to person call." Tell why.

Here are the costs of three-minute calls between David's aunt's home and Chicago.

	Station to Station	Person to Person
Day Rate, between 4:30 A.M. and 7:00 P.M.	85¢ plus 10¢ tax	$1.15 plus 15¢ tax
Night Rate, between 7:00 P.M. and 4:30 A.M.	55¢ plus 15¢ tax	85¢ plus 20¢ tax

3. Find the cost of the 3-minute station to station call (*a*) at the day rate; (*b*) at the night rate.

4. How much would be saved on the station to station call by waiting and using the cheaper night rate?

5. Find the cost of the 3-minute person to person call (*a*) at the day rate; (*b*) at the night rate.

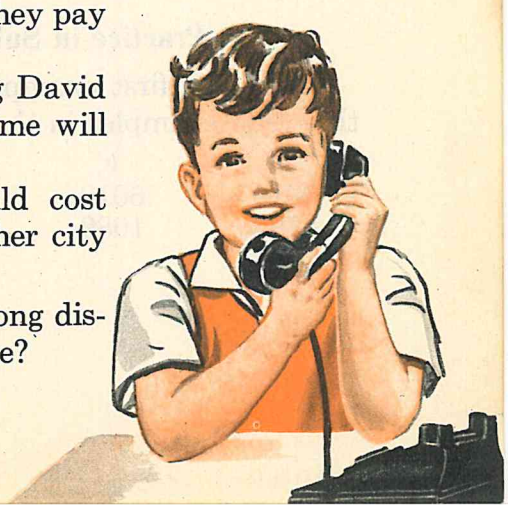
6. How much would be saved on the person to person call by waiting and using the cheaper night rate?

7. "Let us call him tonight after seven o'clock," said Patsy. "But let us make it a person to person call, so we will not need to pay unless David is at home to talk to us." How much must they pay for this 3-minute call?

8. At just 7:05 that evening David answered his call. At what time will the 3-minute call be over?

*9. Find how much it would cost you to call a relative in another city by long distance.

*10. Is the tax you pay on long distance calls about $\frac{1}{4}$ of the rate?



LOOK OUT FOR THE ZEROS

Six thousand cars crossed the Delaware River bridge one Sunday. Only 2,893 cars crossed on Monday. How many more cars crossed the bridge on Sunday?

6000 −2893 7	**Step 1.** See −3. Think −3 ones. Why? Write 7 in ones' place.	0 10 ones
6000 −2893 07	**Step 2.** See −9. Think −9 tens. Why? Write 0 in tens' place to hold that place.	0 9 tens
6000 −2893 107	**Step 3.** See −8. Think −8 hundreds. Why? Write 1 in hundreds' place.	0 9 hundreds
6000 −2893 3107	**Step 4.** See −2. Think −2 thousands. Why? Write 3 in thousands' place.	6 5 thousands

Explain these examples. Name the missing numbers. Copy and work the examples with your book closed.

a. 8000	5000	7003	*b.* 9010	4500
−2643	−1951	−3154	−2456	−4387
5357	3049	3849	?554	?13

Practice in Subtracting with Zeros

Study the first example in the row before you work the other examples in the row. Check your work.

	a	*b*	*c*	*d*	*e*
1.	8010	6010	7020	8010	5010
	6793	1089	6987	4176	4315
	1217				

LET'S PRACTICE

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	a	b	c	d	e
1.	7065	8097	9033	6096	9057
	−4097	−5479	−6059	−5889	−4958
	2968				
2.	60000	90000	80000	70000	40000
	−48642	−59029	−71958	−50690	−33953
	11358				
3.	30200	90600	30900	70800	90500
	−29725	−23642	−27376	−38309	−89857
	475				

Problems to Read and Do

1. Paul had 10 marbles. He gave his little brother $\frac{1}{2}$ of them. Then he lost 2 of the marbles he had left. How many marbles did he then have?

2. Mary had three brothers. Their mother gave all the children two cookies each. How many cookies did she need for all the children?

3. Robert has 3 airplanes. His big brother has 2 airplanes more than Robert. How many airplanes have both boys together?

4. Grace had 10 valentines. She bought 2 more. Then she gave half of all her valentines to her friends at school. How many valentines did she give away?

5. Harry bought 2 marble shooters for 3 cents each. He bought a marble bag for 5 cents. How much money did he spend altogether?

MULTIPLYING 8 BY A NUMBER

How many children are standing in each row in this school chorus? Add by 8's to find how many children there are in 8 rows; in 9 rows.

There are 8 children in each row. Without counting each child, tell how many children there are in 2 rows; in 3 rows; in 4 rows; in 5 rows; in 6 rows; in 7 rows.

Write the reverse and its product for each.

8	8	8	8	8	8
×2	×3	×4	×5	×6	×7
16	24	32	40	48	56

These are new. Study and learn them.

8	8	8
×1	×8	×9
8	64	72

I. Products to Name:

8	8	8	8	8	8	8	8	8
4	7	1	3	8	5	2	9	6
8	8	8	8	8	8	8	8	8
3	8	5	2	6	1	9	4	7

Make a Practice card for each combination you miss.

II. Problems to Read and Do

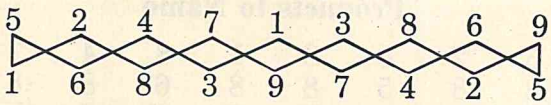
1. James sold melons at his roadside stand at 8 cents apiece. How much did he receive for 9 melons?

2. Tom pasted 8 postcards on each page of his new scrapbook. How many cards did he paste on 8 pages?

3. There are 8 small panes in each large window in Peggy's schoolroom. How many small panes are there in all in the 6 large windows?

4. The new fourth-grade readers cost 80¢ apiece. Jerry's class needs 7 of them. How much will they cost?

III. A Crisscross Game to Play



Follow the line over and under from point to point, multiplying 8 by each of the numbers on the crisscross.

LET'S PRACTICE

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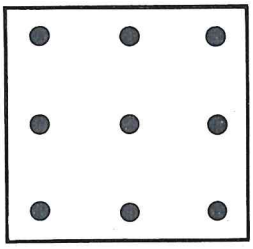
	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	78¢	87	$.83	908	$5.81	856	78¢
	×8	×9	×2	×3	×6	×8	×4
2.	89¢	85	$.78	856	$7.68	678	$8.69
	×5	×1	×7	×9	×5	×6	×7

MULTIPLYING BY EIGHT

Draw 8 pictures just like the one you see at the right. Add the nines to see how many dots there are when you have eight times 9 dots.

You know these. Write the reverse and its product for each.



2	3	4	5	6	7	8
×8	×8	×8	×8	×8	×8	×8
16	24	32	40	48	56	64

These are new.
Study and learn them.

0	1	9
×8	×8	×8
0	8	72

Count by 8's from 0 to 72; from 72 back to 0.

Products to Name

3	6	2	8	8	1	8	4	7	8
8	8	8	5	8	8	6	8	8	3
0	5	8	3	9	5	8	6	9	1
8	8	7	8	8	8	1	8	8	8
4	8	8	7	0	8	8	2		
8	8	2	8	6	4	9	8		

Name the combinations above that have equal products.

Make a Practice card for each combination you need to study.

*MAKING A TABLE OF 8's

Miss Hill asked the class to make a table of the multiplication combinations of 8's by using only the three facts which she gave in this table.

$1 \times 8 = 8$	
$2 \times 8 = 16$	
$3 \times 8 = ?$	
$4 \times 8 = ?$	
$5 \times 8 = 40$	
$6 \times 8 = ?$	
$7 \times 8 = ?$	
$8 \times 8 = ?$	
$9 \times 8 = ?$	

MISS HILL: "How can you find the product of 3×8?"

JACK: "I would add one 8 to the two 8's given. 16 and 8 are 24."

ALICE: "I would add three 8's."

MISS HILL: "If you do not know four 8's, how can you find out?"

ESTHER: "I can double two 8's, or think twice 16."

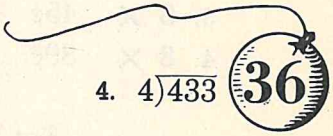
TONY: "If five 8's are 40, four 8's will be one 8 less, or $40 - 8 = 32$."

NELLY: "I could add 8 four times."

ARTHUR: "Since we found three 8's are 24, one more 8 is $24 + 8$, or 32."

How many ways can you use to find the correct products in the table of 8's? Complete the table.

LET'S PRACTICE



Watch the signs.

1. $\begin{array}{r} 756 \\ 48 \\ +956 \\ \hline \end{array}$
2. $\begin{array}{r} 3195 \\ -2968 \\ \hline \end{array}$
3. $\begin{array}{r} 706 \\ \times 5 \\ \hline \end{array}$
4. $4\overline{)433}$
5. $\begin{array}{r} 372 \\ \times 8 \\ \hline \end{array}$
6. $\begin{array}{r} 8090 \\ -3098 \\ \hline \end{array}$
7. $\begin{array}{r} 87 \\ \times 6 \\ \hline \end{array}$
8. $5\overline{)489}$
9. $\begin{array}{r} 9870 \\ -7849 \\ \hline \end{array}$
10. $\begin{array}{r} 7140 \\ -2376 \\ \hline \end{array}$
11. $3\overline{)271}$
12. $\begin{array}{r} 746 \\ \times 8 \\ \hline \end{array}$

PROBLEMS TO READ AND DO

1. Tommy earned 50 cents a week for 8 weeks. How much has he earned in all?

2. How many days are there in 8 weeks?

3. How much more does Tommy need to earn before he can buy a pair of ice skates for $5.00?

4. Anna has an allowance of 25 cents a week. She saves 5 cents a week. How much does she spend? How much money does she spend in 8 weeks?

5. Ed found he could put 8 reading books on each shelf in the book closet. How many books could he put on 6 shelves?

LET'S PRACTICE

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Set 1

	a	*b*	*c*
1. 5 ×	61¢	65	$.84
2. 7 ×	46¢	89	$.70
3. 8 ×	45¢	87	$.90
4. 8 ×	89¢	71	$.25

Set 2

	a	*b*	*c*
1. 4 ×	462	$8.75	906
2. 6 ×	369	$7.50	814
3. 7 ×	512	$4.70	389
4. 8 ×	789	$4.50	629

Set 3

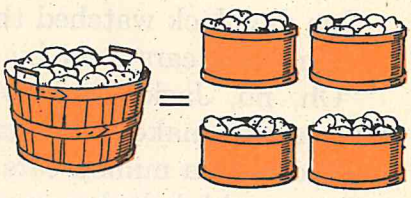
	a	*b*	*c*
1. 5 ×	29	80 cents	37
2. 7 ×	15	98 cents	31
3. 8 ×	26	81 cents	79
4. 8 ×	60	63 cents	34

Set 4

	a	*b*	*c*
1. 4 ×	913	$7.23	854
2. 6 ×	200	$6.45	798
3. 7 ×	843	$9.65	607
4. 8 ×	612	$1.08	397

*MEASURING WITH BUSHELS AND PECKS

Farmers and merchants sometimes measure the fruits and vegetables that they sell by the **bushel** and the **peck**.



1 BUSHEL = 4 PECKS
60 Pounds

1. Look at the picture at the right. How many pecks are there in a bushel?

2. A bushel of potatoes weighs 60 pounds. At this rate how much does a peck of potatoes weigh?

Bushels of different articles do not weigh the same. Here are some bushel weights:

Oats	32	pounds a bushel
Rye	56	" " "
Barley	48	" " "
Corn	60	" " "
Apples	45	" " "

3. Can you explain the difference in these weights?

4. A farmer sold apples at 40 cents a peck, or at $1.30 a bushel. How much more would a bushel of apples bought by the peck cost than when bought by the bushel?

5. Bobby weighed two bushel measures of potatoes. One weighed 58 pounds, the other 62 pounds. Find the difference in their weights. Can you explain the difference?

6. Nowadays business men do not often use bushel and peck measures. It is easier and more accurate to weigh fruit and vegetables. Explain why this is so.

HOW MANY IS A MILLION?

One day Jack watched the cars on the highway.

"A million cars went by today," he told his mother.

"Oh, no, Jack," said Mother. "It takes 10 times 100 cars to make 1,000 cars. There are 1,000 times 1,000 cars in a million cars."

Do you think Jack saw a million cars? Might he have seen 1,000 cars go by that day?

We write one million like this: 1,000,000.

We divide large numbers into groups of three figures. We separate the groups with commas, beginning at the right. Each group has its name. You know that the name of the second group is **thousands.** The name of the third group from the right is **millions.** We read the number 3,400,208 like this: 3 million, 400 thousand, 208.

The table shows the number of automobiles made in the United States in different years.

Year	Number of Cars
1900	4,192
1905	25,000
1910	187,000
1920	2,227,349
1930	3,510,178
1940	4,500,000

1. Find the number which shows how many cars were made in 1920. We read this number: Two million, two hundred twenty-seven thousand, three hundred forty-nine.
2. Find four million, five hundred thousand.
3. Read aloud the numbers in the above table which tell the number of cars made in each year.
4. Write these numbers in words.

LET'S PRACTICE

38

Set 1 Subtraction with Zeros

	a	*b*	*c*	*d*	*e*
1.	6000	7000	4000	8000	6000
	3861	4629	2931	2517	2472
	2139				
2.	9003	4007	7005	8006	9005
	8948	1579	6386	7927	4709
	55				

Set 2 Column Addition

a	*b*	*c*	*d*	*e*	*f*
839	$42.59	68	$.17	$7.76	$63.49
84	.65	9	7.48	9.89	4.57
708	7.68	63	7.96	.05	43.77
974	9.71	79	89.88	8.58	.53

Problems to Read and Do

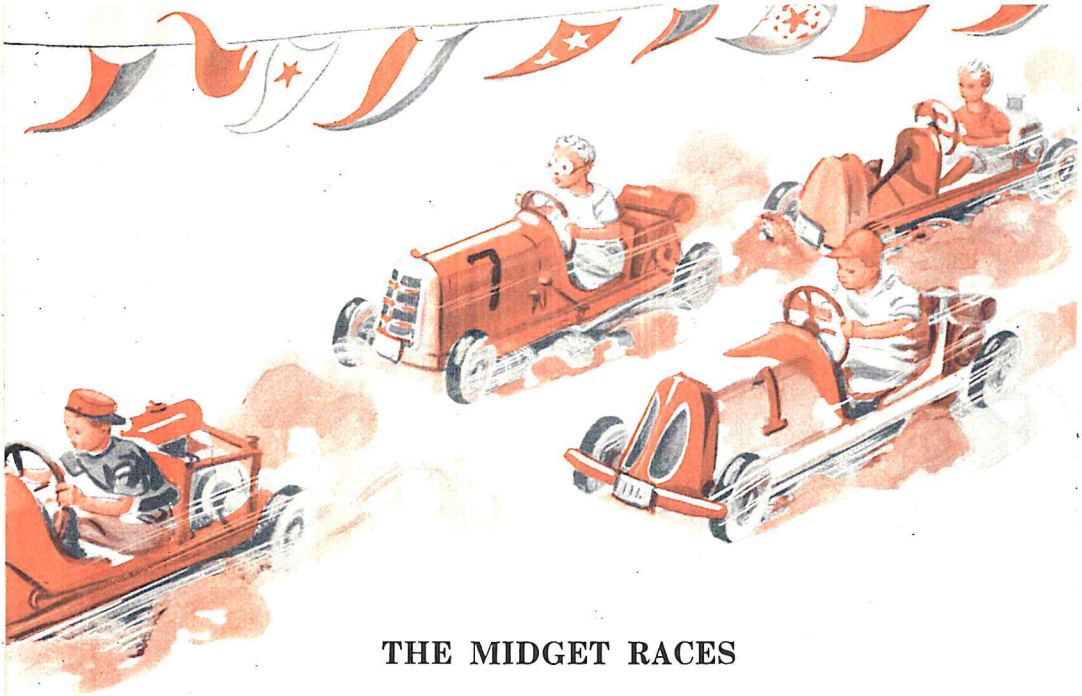
1. Four girls and six boys were playing in the park. If 3 of the children had to go home, how many children were left to play?

2. There were 9 cookies on a plate. Mother divided them equally among 3 children. Tommy ate 1 of his cookies. How many cookies did he have left?

3. I bought a ball for 5 cents and some jacks for 3 cents. How much change should I get from a dime?

4. Jane has 4 dolls. Mary has 3 dolls more than Jane. How many dolls have both girls together?

5. Tickets for the school play are 10¢. Children pay half price. How much will 3 children's tickets cost?



THE MIDGET RACES

David Byrnes belonged to the Junior Midgets of America. He took his midget racing car to the San Marino race. He won a fine helmet for the midget championship prize. Here are some interesting facts about the race of the world's smallest cars.

1. Drivers belonging to the Junior Midget Association are from 6 to 14 years old. What is the difference in these ages?

2. The midget races sometimes draw crowds of two thousand to five thousand people. Write these numbers in figures.

3. Their race track is a 330-foot oval dirt track. One car went around the track in 58 seconds. The winner took only 49 seconds. Find the difference in these times.

4. Midget racing cars are built by their owners with the help of their fathers. They are powered by real motors. They can go as fast as 25 miles an hour. The next time you are riding in a car, ask the driver to go 25 miles an hour. Then you can know how fast midget cars can go. David's new midget car goes 25 miles an hour. His old car went only 21 miles an hour. How much faster can the new car go than the old one?

5. Cars cost from $75 to $1,200 each. How much less than $100 does the $75 car cost? How much more than $1,000 does the $1,200 car cost?

6. The Junior Midget Association had 42 members one year. How much less than 50 members was this?

7. An entrance fee of 75 cents a race goes for the upkeep of the track. David paid for his entrance fee with a dollar bill. How much change did he receive?

8. The average weight of the midget cars is 100 pounds. David weighs 89 pounds. How much more than David weighs does the average midget car weigh?

9. Midget cars average 100 miles on a gallon of gasoline. David's father's car will go 18 miles on a gallon. How much farther will a midget car go on a gallon of gasoline than David's father's car?

*10. Above you see little Bobby. He is seven years old. He has the smallest car in the Junior Midget Association. Make up a problem about Bobby and his car.

HOW WELL CAN YOU COUNT CHANGE?

Sometimes you do not have the exact coins to pay for what you buy at a store. You give the clerk more money than the goods you bought really cost. Then the clerk must give you back some change. The change is the difference between the cost of the goods and the amount of money you give the clerk.

The Chart of 5's

Row 1	Row 2	Row 3	Row 4
5¢	30¢	55¢	80¢
10¢	35¢	60¢	85¢
15¢	40¢	65¢	90¢
20¢	45¢	70¢	95¢
25¢	**50¢**	**75¢**	**$1.00**

Look at the chart above. The amounts in the chart are found by counting by 5's, or **by nickels.**

1. How many 5's do you count in row 1? in row 2? in row 3? in row 4?

2. Look at the bottom amount in each row. Read the amounts across the bottom from left to right. Is that the same as counting by 25's, or **by quarters?**

3. How many 25's do you count in each row?

4. If you had counted as far as 50¢ and wanted to reach $1.00, you could count by quarters like this: "50, 75, $1.00." You could also count by 50's and say, "50, $1.00." Count to $2.00 by 50's.

HOW TO USE THE CHART TO MAKE CHANGE

1. Suppose you buy a ball for 18¢ and give the clerk a quarter. What change will he count?

First find where 18 cents would be in the chart of 5's. It will be between 15 and 20. Say the amount of the purchase first, "18." Then count by pennies to the 20 like this, "19, 20." Then count by nickels to the 25.

2. You buy a ball for 18¢ and give the clerk a half dollar. What change will you count? After you reach 25 in the chart, in what ways could you reach 50? Study the chart to find the quickest way.

3. Suppose that you spend 8¢, and give the clerk a dollar bill. The clerk will start with the amount you spent, and say, " 8¢." He will move to the 10 in the chart. So he will give you 2 pennies and say, "10." He may then give you a nickel and say, "15¢," a dime, and say, "25¢," a quarter and say, "50¢," and a half dollar and say, "$1.00."

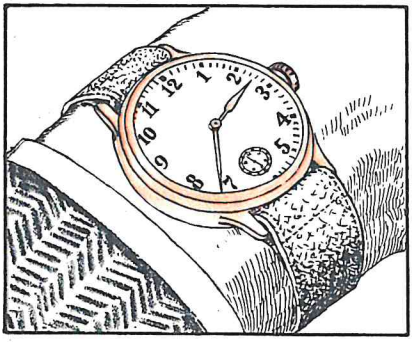
On the chart on page 220 you can see that after the clerk counted by nickels to the first quarter, he then counted by quarters to the half dollar and then by half dollars to the dollar. Study the chart to figure out other coins he could use to count the change for this sale.

Use the chart to count the change for these purchases:

You Spend	You Give the Clerk	You Spend	You Give the Clerk	You Spend	You Give the Clerk
32¢	$1.00	52¢	75¢	3¢	50¢
7¢	50¢	16¢	$1.00	21¢	$1.00
63¢	$1.00	24¢	$1.00	41¢	$1.00

MIKE'S NEW WATCH

1. Mike received this fine new watch on his ninth birthday. What time is it by Mike's watch?



2. When the minute hand will be exactly on 8, what time will it be?

3. What is the small hand at the bottom of the watch called? What does it show?

Measures of Time

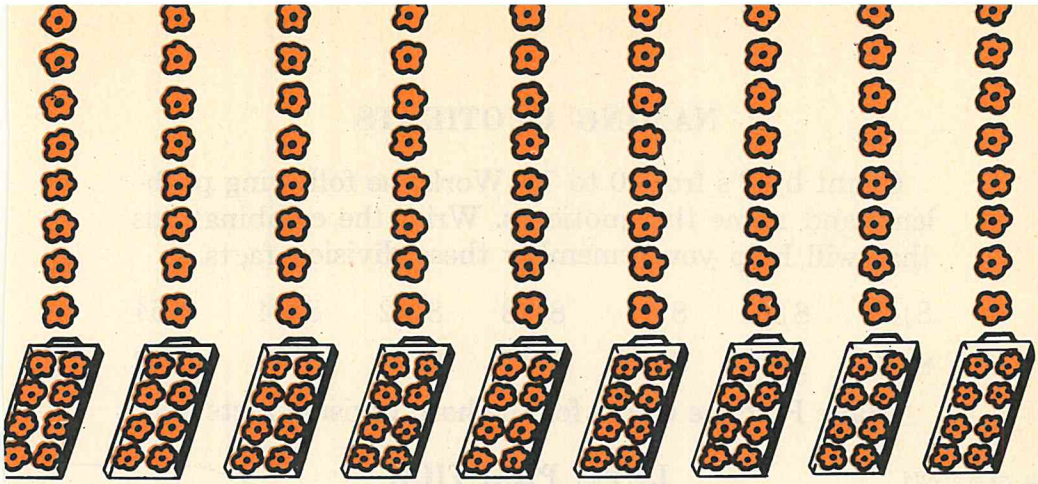
60 seconds = 1 minute	**24 hours = 1 day**
60 minutes = 1 hour	**7 days = 1 week**

4. When Mike looks at his watch at 9:30 A.M. it is light. It is morning. The time from midnight to noon is shown by the letters A.M. When Mike looks at his watch at 9:30 P.M. it is dark. It is night. The time from noon to midnight is shown by the letters P.M. Which of the following mean morning? afternoon?

5:30 P.M. 10:45 A.M. 3:10 A.M. 7:25 P.M.

5. The recess bell rang at 10:30 A.M. Mike timed the children with his new watch. It took them exactly two minutes to get to their seats after the bell rang. When were the boys and girls in their seats?

6. It took Jane 32 seconds to say a group of multiplication combinations. It took Mike 50 seconds. How many seconds more did Mike need than Jane?



DIVIDING BY EIGHT

Mother has made the cookies pictured above. She can bake 8 cookies at one time in a pan.

1. How many cookies are there in all?
2. How many cookies are in the first 2 rows?
3. How many pans can she fill with 16 cookies?

Copy the chart below and fill in the blanks.

$$\begin{array}{r} 2 \\ 8\overline{)16} \end{array}$$

Number of Cookies	Number of Pans	Division Facts	Number of Cookies	Number of Pans	Division Facts
0	0	$\begin{array}{r} 0 \\ 8\overline{)0} \end{array}$	40	(?)	$\begin{array}{r} 5 \\ 8\overline{)40} \end{array}$
8	1	$\begin{array}{r} 1 \\ 8\overline{)8} \end{array}$	48	(?)	$\begin{array}{r} 6 \\ 8\overline{)48} \end{array}$
16	(?)	$\begin{array}{r} 2 \\ 8\overline{)16} \end{array}$	56	(?)	$\begin{array}{r} 7 \\ 8\overline{)56} \end{array}$
24	(?)	$\begin{array}{r} 3 \\ 8\overline{)24} \end{array}$	64	(?)	$\begin{array}{r} 8 \\ 8\overline{)64} \end{array}$
32	(?)	$\begin{array}{r} 4 \\ 8\overline{)32} \end{array}$	72	(?)	$\begin{array}{r} 9 \\ 8\overline{)72} \end{array}$

NAMING QUOTIENTS

Count by 8's from 0 to 72. Work the following problems and name the quotients. Write the combinations that will help you remember these division facts.

8)40	8)56	8)0	8)48	8)72	8)24	8)64
8)56	8)32	8)48	8)16	8)64	8)8	8)72

Make Practice Cards for the hard division facts of 8.

LET'S PRACTICE

39

Divide the numbers in each row by the number in heavy type at the left of the row. Check your work.

Set 1

	a	*b*	*c*	*d*	*e*	*f*
1. ÷ **6**	296	$6.42	483	$2.16	155	$5.34
2. ÷ **7**	97	$4.76	679	$8.75	286	$7.63
3. ÷ **8**	408	$5.60	728	$4.00	480	$2.48
4. ÷ **8**	640	$1.68	648	$8.08	720	$8.00

Set 2

	a	*b*	*c*	*d*	*e*	*f*
1. ÷ **5**	84	$1.70	352	$5.40	298	$4.50
2. ÷ **6**	459	$8.04	125	$5.70	650	$2.28
3. ÷ **7**	759	$3.92	218	$5.04	104	$9.66
4. ÷ **8**	568	$1.60	320	$4.88	80	$2.40

Find $\frac{1}{8}$ of $.40; of 24 boys; of 72 books; of 56 days; of 640 pages; of 488 dollars.

Find $\frac{1}{7}$ of $.63; of 21 chairs; of 42 marbles; of $4.90; of 217 tickets; of 7 candy bars.

8 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B	C	D	E	F	G
0 8)0	1	2	3	4	5	6	7
1 8)8	9	10	11	12	13	14	15
2 8)16	17	18	19	20	?	?	?
3 8)24							
4 8)32							
5 8)40							
6 8)48							
7 8)56							
8 8)64							
9 8)72							

1. In an example like 8)192 you will need to think 8)19. You will not find this fact in the even division table of 8's. But the even division table of 8's will help you to find the right quotient figure in examples of this kind.

2. Study the chart. It shows you that when you see 8)19, you must think back to 8)16, since 8)19 comes between 8)16 and 8)24.

3. Copy the chart above and fill in and complete all the numbers in rows A, B, C, D, E, F, and G for each of the division combinations of 8. Make the chart like the ones you made for the 5's, 6's, and 7's.

4. Use the chart you have made to find out what number you should think back to when dividing each of the following numbers by 8: 33; 50; 67; 12; 29; 22; 79; 57; 42; 3; 76; 53; 38; 15; 73; 10; 59; 68; 45; 54; 7; 65; 26; 35; 20; 61; 46; 31; 78; 63; 37; 19.

FOUR LESSONS IN DIVISION

Set 1

Divide each number by 7.

	a	*b*	*c*
1.	87	240	$2.80
2.	634	720	$8.92
3.	528	213	$2.59
4.	607	768	$7.56
5.	322	403	$6.65

Set 2

Divide each number by 7.

	a	*b*	*c*
1.	97	186	$3.36
2.	691	352	$8.68
3.	851	62	$5.81
4.	555	491	$7.63
5.	459	118	$3.64

Set 3

Divide each number by 8.

	a	*b*	*c*
1.	245	459	$5.36
2.	678	879	$9.92
3.	236	98	$4.00
4.	723	290	$3.04
5.	166	462	$8.48

Set 4

Divide each number by 8.

	a	*b*	*c*
1.	407	858	$3.20
2.	800	283	$8.64
3.	202	873	$3.76
4.	715	697	$9.84
5.	398	852	$4.48

TWO LESSONS IN MULTIPLICATION

Multiply by the number at the left.

Set 1

		a	*b*	*c*
1.	6 ×	58¢	$.37	$4.79
2.	7 ×	681	409	$3.75
3.	8 ×	$.50	47¢	$6.98
4.	8 ×	743	961	$8.05

Set 2

		a	*b*	*c*
1.	6 ×	750	614	$2.89
2.	7 ×	27¢	$.85	96 cents
3.	8 ×	913	850	$6.02
4.	8 ×	$.27	14¢	32 cents

*MAKING CHANGE

If your mother sent you to the grocery store to buy any of the groceries pictured below, tell how the clerk might count the change for each purchase.

Cost 29¢
Money paid $1 bill

Cost 22¢
Money paid $1 bill

Cost 23¢
Money paid 50¢

Cost 39¢
Money paid $1 bill

Cost 5¢
Money paid 25¢

Cost 8¢
Money paid 50¢

LET'S PRACTICE

Watch the signs. Check your work.

1. $.08 + 2.43 + .92 + 32.88

2. 23030 − 3788

3. 8)8260

4. 734 × 6

5. 7000 − 3251

6. 682 × 9

7. 7)650

8. 6)$641.46

9. 600 × 8

10. $87.76 − 54.80

11. $7.60 × 8

12. 8)$71.04

13. 264 + 178 + 36 + 789 =

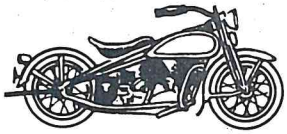
14. $675.49 − $265.38 =

15. 6000 − 1797 =

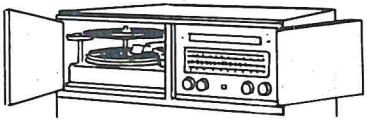
*DID YOU KNOW THESE FAMOUS FIRSTS?

Here are things which we see and enjoy the use of nearly every day. They were first used on the dates given below.

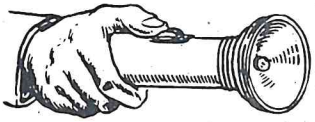
1. Find out how many years each has been in use in our country. To do this, subtract each date in turn from the present year. How many were invented less than 50 years ago?



1868 Motorcycles



1877 Phonograph



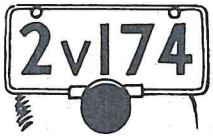
1898 Flashlights

1847 Postage Stamps

1784 Newspapers

1920 Radio Broadcasting

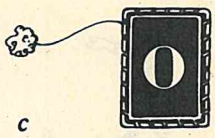
1926 Talking Pictures



1901 Automobile License Plates

2. Arrange these inventions in the order of the year they were first used.

LET'S SEE IF YOU KNOW HOW



Addition

	a	*b*	*c*	
1.	26	55	5	**(11)**
	87	7	75	
2.	246	387	698	**(13)**
	808	870	885	
3.	419	66	6	**(13)**
	73	835	299	

	a	*b*	*c*	
4.	69	59	8	**(101)**
	87	4	99	
	46	97	97	
		37	9	
5.	$7.45	$8.27	$7.39	**(104)**
	4.29	.66	5.66	
	3.67	8.06	5.08	
		5.99	1.95	

6. What is the sum of $6.87 + $.24 + $2.74 + $6.34? **(104)**

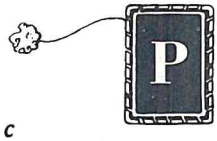
Subtraction

	a	*b*	*c*	
1.	148	104	166	**(19)**
	56	70	96	
2.	517	908	436	**(19)**
	262	280	344	
3.	480	791	592	**(19)**
	341	732	585	
4.	801	332	941	**(19)**
	697	268	475	
5.	731	621	803	**(19)**
	99	58	9	

	a	*b*	*c*	
6.	800	500	300	**(48)**
	386	24	42	
7.	$8.01	$4.02	$4.23	**(107)**
	7.64	.19	4.18	
8.	$17.10	$75.62	$202.32	**(107)**
	16.30	.53	79.44	
9.	8973	7294	5786	**(200)**
	3576	5769	4887	
10.	7900	3000	10005	**(208)**
	5754	2499	6926	

If you have difficulty with any examples, turn to the page number at the right of that group for help.

LET'S SEE IF YOU KNOW HOW

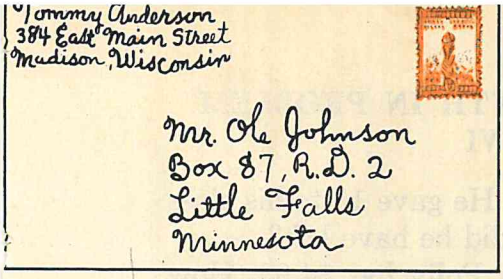


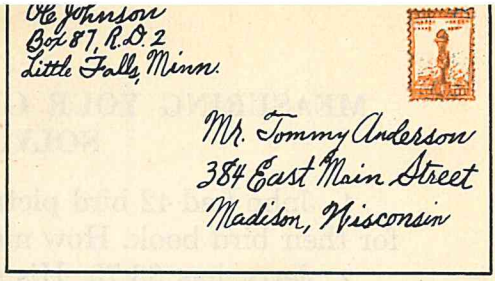
Multiplication

	a	*b*	*c*			*a*	*b*	*c*	
1.	70	38	68	**(28)**	4.	758	394	639	**(81)**
	8	7	6			7	8	6	
2.	750	851	490	**(79)**	5.	$.14	96¢	28 cents	**(116)**
	6	8	7			6	7	8	
3.	904	612	906	**(80)**	6.	$5.76	$7.50	$7.28	**(117)**
	6	7	8			8	7	6	

Division

	a	*b*	*c*	*d*	
1.	7)51	8)54	6)29	8)65	**(59)**
2.	6)96	7)84	8)96	6)84	**(61)**
3.	6)77	7)96	8)99	6)80	**(66)**
4.	7)392	8)376	6)510	8)744	**(90)**
5.	6)476	8)450	7)589	8)595	**(90)**
6.	8)840	7)735	6)654	8)872	**(98)**
7.	4)837	8)857	7)767	3)923	**(98)**
8.	7)980	6)900	8)960	5)850	**(118)**
9.	6)721	5)953	7)916	8)965	**(119)**
10.	7)635	8)643	6)184	8)486	**(119)**
11.	7)$7.56	7)$7.28	6)$6.12	8)$8.24	**(140)**
12.	8)$7.84	7)$4.69	6)$4.08	6)$3.42	**(142)**





OLE AND TOMMY EXCHANGE CHRISTMAS MESSAGES

Ole lives in the country. Tommy lives in the city. This year they exchanged Christmas messages.

1. Read the address on each envelope. What is different about the two addresses?

What the Numbers in Ole's Address Mean

R.D. means Rural Delivery. Rural means "country." The country is divided into a number of postal routes.

The **2** in Ole's address means that the mail carrier on Route 2 must deliver the letter to someone along his route. **Box 87** tells the mail carrier in just what mail box along Route 2 to leave the letter. The mail boxes along the road are numbered.

What the Numbers in Tommy's Address Mean

The houses on the street where Tommy lives are numbered. The number **384** is the number of Tommy's house. The postman will take the letter to this **house number.**

2. Why is there a **return address** on each envelope?
3. Do these children live in the country or in the city?

Ned: 3286 Charles Street Mae: R.D. 6, Box 76
Mary: Box 134, R.D. 3 Bill: 936 Lincoln Avenue

*4. Learn to write your own address correctly.

MEASURING YOUR GROWTH IN PROBLEM SOLVING VI

1. John had 42 bird pictures. He gave 15 to his class for their bird book. How many did he have left?

2. Jerry has $3.75. His sister Polly has $4.98. How much money do the two children have in all?

3. On a test of 40 examples Miriam worked 6 examples incorrectly. How many examples did she work correctly?

4. How many days are there in 4 weeks?

5. Gertrude has 75 pennies. She wants to change the pennies into nickels. How many nickels should she receive for the 75 pennies?

6. Harry saw two bicycles. One cost $18.75. The other cost $23.40. How much more did the one cost than the other?

7. One year Grace saved $8.47, George saved $12.90, and Sally saved $9.48. How much did the three children save in all?

8. Which is most, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, or $\frac{1}{8}$ inch?

9. At a candy sale the fourth-grade class sold 28 bags of candy at 5 cents a bag. How much did they receive in all for the candy?

10. Sue's mother paid $1.68 for a 6-pound chicken for their Sunday dinner. How much did the chicken cost a pound?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

ACROSS THE BRIDGE TO THE NEW CHAPTER

1. Explain the following words and phrases:

A.M.	bushel	local call	Roman numerals
P.M.	one day	second hand	long-distance call
peck	tally sheet	minute hand	telephone day rate
votes	hour hand	Arabic numerals	telephone night rate

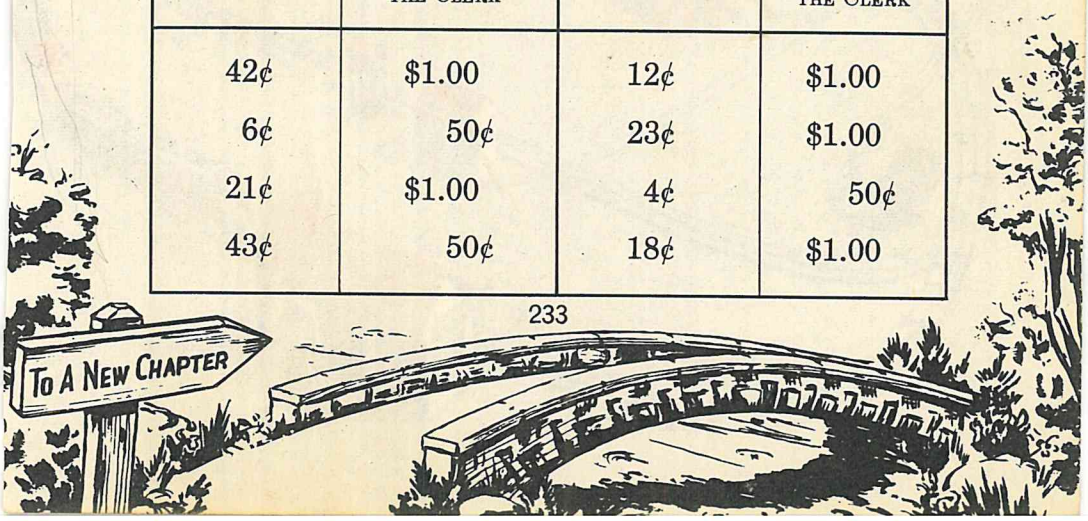
2. Read these Roman numerals: V X L I C IX CC XI LX XXX XL XC LVI

3. Read these Arabic numerals:

5,000	2,000	8,000	4,000
25,000	82,000	18,000	54,000
425,000	382,000	618,000	154,000
425,673	382,500	618,030	154,002

4. How many pecks are there in one bushel?
5. How many seconds are there in 7 minutes?
6. How many minutes are there in 8 hours?
7. How many hours are there in 6 days?
8. How many weeks are there in 28 days?
9. Figure ways to count the change for these purchases:

You Spend	You Give the Clerk	You Spend	You Give the Clerk
42¢	$1.00	12¢	$1.00
6¢	50¢	23¢	$1.00
21¢	$1.00	4¢	50¢
43¢	50¢	18¢	$1.00



CHAPTER VII

The Nines
New Measures

HOW MUCH DID BILL SAVE ON THIS SALE?

Bill saw this train advertised in the holiday sale sheet of a large department store. It was just the train he had always wanted! He bought it that very day.

1. Why is this called a 33-piece set? Read the list of items named in the set and count them.

2. Find out what the train set would have cost if the pieces were bought separately.

3. How much did Bill save by buying the complete set instead of buying the pieces separately?

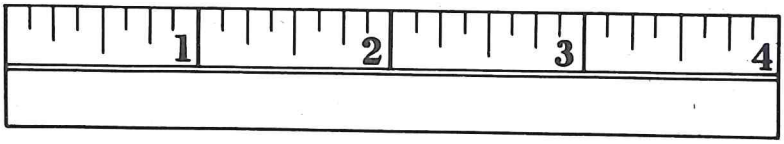
4. In the first hour of the sale the clerk sold 8 sets. How much money did she take in for these sales?

5. The 7 cars together measure 4 feet. How many inches long is the train?

A RULER HELPS US TO MEASURE ACCURATELY

Tom and Joe were playing baseball. Crash! went the window in Tom's garage. The boys must buy a new window. Explain why they must measure very carefully to get the exact measurement for the new window.

They used a foot ruler to measure the window. What do the numbers and lines on the ruler mean?



1. How many inches are there in 1 foot? How many inches less than 1 foot is the piece of ruler above?

2. Each inch on the ruler is divided into parts of an inch. Point to the half-inch ($\frac{1}{2}$ inch) marks. How do you know they are half-inch marks?

3. Point to the quarter-inch ($\frac{1}{4}$ inch) marks. How many quarter inches are there in one inch? in $\frac{1}{2}$ inch?

4. Point to the eighth-inch ($\frac{1}{8}$ inch) marks. How many eighth inches are there in 1 inch? in $\frac{1}{2}$ inch? in $\frac{1}{4}$ inch?

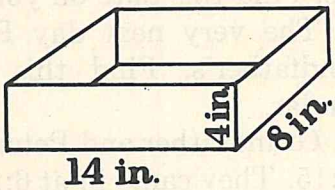
5. Use a foot ruler to measure some objects in your classroom, such as sheets of paper, boxes, or books. Express the lengths, using fractions of an inch.

6. Which is more, $\frac{1}{2}$ inch or $\frac{3}{4}$ inch? $\frac{1}{4}$ inch or $\frac{1}{8}$ inch? $1\frac{1}{2}$ inch or $1\frac{3}{8}$ inch? Use the ruler to prove that your answer is correct.

*7. If there were no fractions like $\frac{1}{2}$ could we measure lengths between 1 inch and 2 inches? Explain.

MAKING A BIRD FEEDING STATION

The snow was very deep. The birds could not find food to eat. So Billy and Alice made a bird feeding station which they put at the top of a pole in their back yard. The drawing at the right is a picture of the station they made.



1. How long is the box?
2. How wide is the box?
3. How deep is the box?
4. Each side of the box was made with a single board. How long and how wide were the boards they needed for the long sides? How many boards did they need for the long sides?
5. How long and how wide were the end boards they needed? How many end boards did they need?
6. Would 2 boards each 4 inches wide, placed side by side, be enough for the bottom of the box?
7. One board that Billy used for a side was 21 inches long. How many inches did he have to cut off to make it the right length?
8. They nailed the box on a tree stump that was 4 feet 6 inches high. How much more than 1 yard high was the stump?
9. Alice counted the birds that came to eat the crumbs she put into the box. The first hour 8 birds came, the second hour 15 birds came, and the third hour 7 birds came. How many birds came in all?

*10. What does our government do to protect bird life?

PUTTING UP PICKLES

Such fun! Peter and Mary-Jo have gone to Grandfather's farm for their summer vacation.

1. School was out the Friday of the second week in June. Find this date on your schoolroom calendar.

2. The very next day Peter and Mary-Jo went to Grandfather's. Find this date on your schoolroom calendar.

3. Grandfather and Peter went out to pick cucumbers at 5:15. They came in at 6:20. How long did they work?

4. They picked three baskets of cucumbers. There were 50 cucumbers in each basket. How many cucumbers did they pick in all?

5. Mary-Jo helped Grandmother slice some cucumbers to make her favorite pickles. She cut very thin slices. She sliced 6 quarts of cucumbers. Grandmother sliced 2 quarts of onions. How many quarts of vegetables did they slice in all?

6. How many gallons of sliced vegetables had they cut? (see problem **5.**)

7. They began working at 7:25. When it was 7:50, how many minutes had they been at work?

8. This is Grandmother's recipe for sliced pickles.

Grandmother **doubled** the recipe. Change the above recipe so that each amount will be doubled. Would they have to double the time they left the sliced cucumbers and onions standing in the salt? Explain.

9. This is the measuring cup Grandmother used for the salt. Tell how much salt she used when she doubled the recipe.

Explain how much water she used when she **doubled** the recipe.

10. How many kinds of measures did this recipe call for? List them on a piece of paper.

*11. Find out other measures used in cooking and baking. How long a list can you make?

HOW LONG IS A MILE?

1. What unit of measure is used to measure the length of a pencil? the length of a room? the length of the cloth used in a dress?

2. John said, "According to the speedometer on our automobile, the distance from my house to the school is exactly 1 mile. I walk 8 blocks to school." What part of a mile is 1 block in the city where John lives?

3. Do you know how long a mile is? Name some place that you think is about a mile from the school.

4. If you know that 5,280 feet = 1 mile, how can you find the number of yards in one mile?

1 mile = 5,280 feet = 1,760 yards.

5. How many steps each 2 feet long would it take to walk a mile?

6. If there are 8 blocks in a mile, how many feet long is each block? How many yards long? Do all blocks have the same length where you live?

7. What would be a good way to measure the length of a city block? If you live in a city, find the length of the block in which your school is built.

8. How many feet are there in $\frac{1}{4}$ mile? in $\frac{1}{2}$ mile? in $\frac{1}{8}$ mile? Name some places that you think are about these distances from your school.

9. Farms are sometimes measured by the rod. A rod is $16\frac{1}{2}$ feet or $5\frac{1}{2}$ yards long. There are 320 rods in a mile. How many rods are there in $\frac{1}{2}$ mile?

*10. Measure off a distance equal to a rod.

FINDING REMAINDERS IN DIVIDING MONEY

Carl wished to divide his summer savings of $8.75 into 6 equal piles. How much money was in each pile?

$1.45 and 5¢ r.	
6)$8.75	Work the example.
6 xx	Write the remainder 5¢ as you see it in
27	the quotient in the model.
24	Be sure to place the $ sign and decimal
35	point to show dollars and cents.
30	Write the remainder as cents.
5	

Study the following examples to see how the quotients and remainders are written.

1. $ 3.70 and 1¢ r.

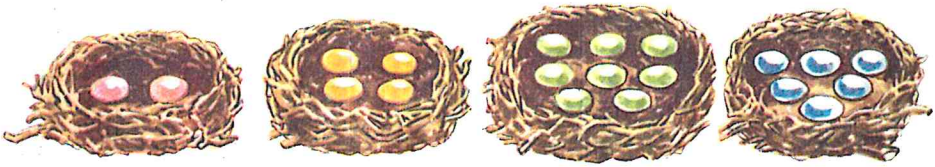
```
5)$18.51
  15 xx
   35
   35
    1
```

2. $ 4.09 and 2¢ r.

```
6)$24.56
  24 xx
    56
    54
     2
```

Find the quotients below:

	a	*b*	*c*	*d*	*e*
3.	7)$3.04	8)$9.85	6)$2.90	8)$6.05	7)$9.71
4.	7)$14.89	6)$80.75	8)$37.00	7)$67.56	6)$16.58
5.	8)$7.12	7)$50.30	6)$9.36	7)$53.20	8)$22.13
6.	6)$18.75	7)$3.54	8)$8.70	8)$76.32	7)$34.35
7.	6)5869	8)6409	8)7742	6)5402	8)3646



Nest A. Nest B. Nest C. Nest D.

THE MEANING OF AVERAGE

If the eggs above were divided equally among the 4 nests, how many eggs would there be in each nest?

One way to find out would be:

first: to take 3 eggs from the nest of 8 (nest C), and put them in the nest of 2 eggs (nest A).

next: to take one egg from the nest with 6 (nest D) and put it with the 4 eggs in nest B.

We say the **average** number of eggs in each nest is 5.

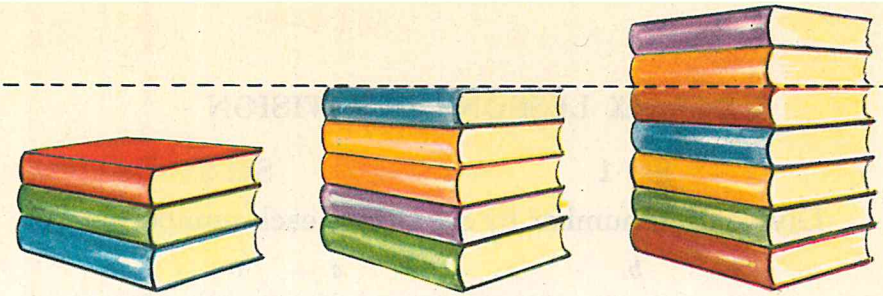
An easier way to find the average number of eggs is:

$\begin{array}{r} 2 \\ 4 \\ 8 \\ \underline{6} \\ 20 \end{array}$	I. Add to find the total number of eggs in the four nests.
$\begin{array}{r} 5 \\ 4\overline{)20} \end{array}$	II. Divide by the number of nests to find the average number of eggs.

To find the average of two or more numbers, (1) find the sum of the numbers, (2) then divide this by the number of numbers you added.

Find the average of these numbers:

a	*b*	*c*	*d*	*e*	*f*	*g*	*h*
4	8	9	8	39	42	46	24
7	8	7	7	84	38	54	30
7	7		5	45	56		42
	9		7		24		16
			3		35		



FINDING AVERAGES

1. Joe read 3 library books the first month of school, 5 books the second month, and 7 books the third month. How many books a month did Joe read on the average?

2. In which month did he read more than the average?

3. In which month did he read less than the average?

4. The children were divided into teams to sell tickets for the school hobby show. On one team Harry sold 5 tickets, Mary sold 3, Gertrude sold 7, and Fred sold 9. What was the average sold by each child?

5. On another team Jane sold 6 tickets, Billy sold 2, Peter sold 9, and Helen sold 3. What was the average number of tickets sold by each child on this team?

6. Which of the two teams had the better average?

7. Susan received 95 on an addition test, 90 on a subtraction test, 94 on a multiplication test, and 89 on a division test. What was her average mark on these arithmetic tests?

8. The daily attendance in the fourth grade last week was 32 on Monday, 28 on Tuesday, 30 on Wednesday, 31 on Thursday, and 29 on Friday. What was the average attendance that week?

*9. Find the average daily attendance in your grade for the past school week.

SIX LESSONS IN DIVISION

Set 1

Divide each number by 8.

	a	*b*	*c*
1.	395	$3.04	$20.04
2.	486	$8.56	$72.03
3.	450	$2.49	$60.32
4.	802	$9.60	$38.67
5.	790	$2.18	$69.57

Set 2

Divide each number by 7.

	a	*b*	*c*
1.	507	$4.55	$10.05
2.	563	$8.93	$28.05
3.	742	$3.77	$40.22
4.	942	$4.83	$58.61
5.	689	$6.79	$62.51

Set 3

Divide each number by 6.

	a	*b*	*c*
1.	405	$3.06	$15.89
2.	650	$5.60	$44.14
3.	352	$7.92	$24.48
4	576	$3.49	$43.78
5.	639	$2.82	$51.22

Set 4

Divide each number by 5.

	a	*b*	*c*
1.	193	2800	$3.52
2.	248	3213	$7.37
3.	540	6445	$4.75
4.	339	1538	$5.18
5.	292	1020	$8.49

Set 5

Divide each number by 4.

	a	*b*	*c*
1.	270	3560	$2.18
2.	343	2833	$9.44
3.	429	3927	$1.98
4.	660	8016	$3.75
5.	253	1115	$1.02

Set 6

Divide each number by 3.

	a	*b*	*c*
1.	140	2402	$1.60
2.	777	2231	$5.38
3.	188	1525	$2.14
4.	319	2962	$6.12
5.	924	1501	$2.08

MEASURING A RABBIT PEN

Bob is measuring the distance around the rabbit pen he is repairing. He wishes to buy new wire netting for it. The drawing at the right is a picture of the pen. How much wire netting does Bob need?

1. How many sides of the pen are 4 feet long? How many are 5 feet long?

2. How many feet of wire netting does Bob need to go around the whole rabbit pen? Be sure to figure enough for all sides of the rabbit pen.

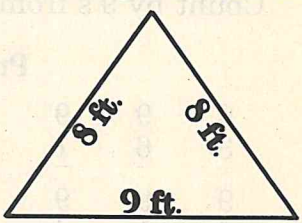
3. The netting Bob wants to buy costs 5 cents a foot. How much would the netting cost?

The distance around the outside of any surface is called its perimeter.

4. Show that the perimeter of the rabbit pen is equal to 2 × 4 feet plus 2 × 5 feet, or 8 feet plus 10 feet.

5. What is the perimeter of a chicken yard that is 20 feet long and 16 feet wide?

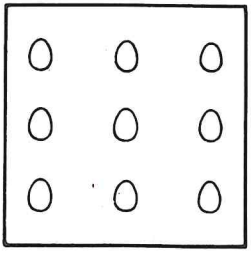
6. Jack has planted a flower bed shaped like the triangle at the right. How much would a wire fence around the flower bed cost at 4 cents a foot?



7. Tony made a sand box for his baby sister. He made it 3 feet wide and 6 feet long. Find the perimeter of this sand box. Draw a picture of it.

MULTIPLYING WITH 9

1. Draw 9 pictures like the one you see at the right. Then add the eggs by 9's to see how many there are when you have nine times 9 eggs.



You know these:

Write the reverses in pairs.

$9 \times 2 = 18$	$9 \times 3 = 27$	$9 \times 4 = 36$	$9 \times 5 = 45$	$9 \times 6 = 54$	$9 \times 7 = 63$	$9 \times 8 = 72$
$2 \times 9 = 18$	$3 \times 9 = 27$	$4 \times 9 = 36$	$5 \times 9 = 45$	$6 \times 9 = 54$	$7 \times 9 = 63$	$8 \times 9 = 72$

These are new. Study and learn them.

What have you discovered about multiplying with 0's? with 1's?

$9 \times 1 = 9$	$9 \times 9 = 81$	$0 \times 9 = 0$	$1 \times 9 = 9$

Count by 9's from 0 to 81; from 81 back to 0.

Products to Name

9	9	9	9	9	9	9	9	9
3	6	1	5	8	2	7	4	9
9	9	9	9	9	9	9	9	9
8	1	4	6	3	9	2	5	7

Make Practice Cards for the hard combinations.

PRACTICING WITH 9's

I. Rolling Number Hoops

Let your teacher time you as you roll these hoops. To make them roll, multiply 9 by each of the numbers inside each hoop. Can you roll both hoops without a mistake? Which hoop rolled faster? Ready, GO!

II. Problems to Read and Do

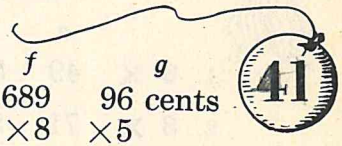
1. Barbara needs 9 inches of ribbon to tie each notebook. How many inches of ribbon will she need to tie 6 notebooks?

2. How many inches more than a yard of ribbon is this?

3. Perry arranged 72 chairs for a program. He placed 8 chairs in each row. How many rows did he make?

4. Socks were on sale at 29¢ a pair. Sue's mother bought her 5 pairs. How much did she pay for them?

LET'S PRACTICE



	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	69	98¢	$.95	789	$9.78	689	96 cents
	×9	×4	×2	×9	×7	×8	×5
2.	97	89¢	$.79	907	$6.91	895	$7.98
	×1	×3	×8	×6	×7	×6	×5

MORE PRACTICE WITH 9's

I. Products to Name:

2	7	4	9	1	8	3	9	0	6
9	9	9	6	9	9	9	5	9	9
9	9	5	9	2	7	3	9	1	4
4	9	9	7	9	9	9	8	9	9
6	9	0	5	9	9	9	8		
9	3	9	9	2	9	1	9		

Name the combinations above that have equal products.

Make a Practice card for each combination you need to study.

II. Problems to Read and Do

1. How many oranges are 9 dozen oranges?
2. At 39 cents a dozen what will 9 dozen oranges cost?
3. How many days are there in 9 weeks?
4. How many minutes are there in 9 hours?

LET'S PRACTICE

42

Set 1	a	b	c	Set 2	a	b	c
1. 6 ×	49	$.80	26¢	1. 7 ×	613	$5.00	487
2. 8 ×	71	$.48	39¢	2. 8 ×	751	$6.30	894
3. 9 ×	28	$.17	95¢	3. 9 ×	801	$3.64	725
4. 9 ×	74	$.90	65¢	4. 9 ×	754	$2.36	891

WHICH IS MORE?

Which is more, 9 × 29, or 250?
Think: 29 is almost 30, or 3 tens.
9 × 3 tens is 27 tens, or 270.
So 9 × 29 is almost 270.
Therefore 9 × 29 is more than 250.

Copy the numbers below one group at a time. Draw a line around the part that you think is larger. Then work the example to see if your estimate was correct.

	a	*b*	*c*
1.	4 × 29, or 140.	3 × 28, or 70.	2 × 49, or 73.
2.	6 × 39, or 250.	8 × 32, or 265.	7 × 62, or 450.
3.	4 × 48, or 170.	7 × 48, or 353.	3 × 71, or 180.
4.	5 × 21, or 120.	9 × 42, or 537.	5 × 68, or 407.

Estimating Answers

Copy the examples below. Beside each example write what you think the answer will be. Then multiply to find the answer. Compare it with your estimate.

	a	*b*	*c*	*d*	*e*	*f*	*g*
5.	28	49	61	59	47	79	59
	×5	×3	×2	×4	×2	×7	×6

LET'S PRACTICE

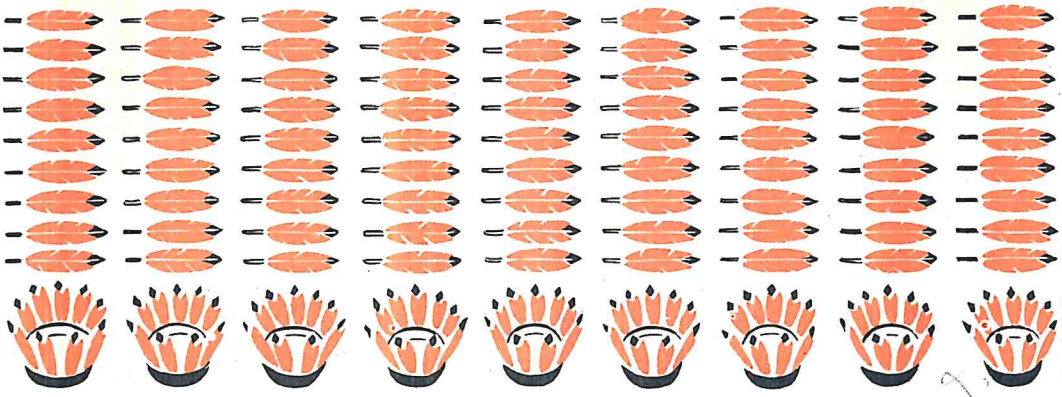
43

Set 1

		a	*b*	*c*
1.	6 ×	38	15 cents	79
2.	8 ×	62	50 cents	98
3.	9 ×	93	48 cents	60
4.	9 ×	81	72 cents	36

Set 2

		a	*b*	*c*
1.	7 ×	921	$6.87	945
2.	8 ×	612	$7.50	489
3.	9 ×	961	$8.02	759
4.	9 ×	704	$9.60	385



DIVIDING BY 9

The costume group made Indian headbands for the Columbus play. They put 9 feathers in each headband.

1. How many feathers did they color in all?
2. How many feathers are there on each headband?
3. How many feathers are there in the first 2 rows?
4. How many headbands did they make with 18 feathers?

Copy the chart below and fill in the blanks.

Number of Feathers	Number of Bands	Division Fact	Number of Feathers	Number of Bands	Division Fact
0	0	$9\overline{)0}$ = 0	45	(?)	$9\overline{)45}$ = 5
9	1	$9\overline{)9}$ = 1	54	(?)	$9\overline{)54}$ = 6
18	(?)	$9\overline{)18}$ = 2	63	(?)	$9\overline{)63}$ = 7
27	(?)	$9\overline{)27}$ = 3	72	(?)	$9\overline{)72}$ = 8
36	(?)	$9\overline{)36}$ = 4	81	(?)	$9\overline{)81}$ = 9

Name the quotients. Write the multiplication combination that will help you remember each.

9)81	9)9	9)72	9)18	9)54	9)36	9)63
9)72	9)27	9)81	9)54	9)0	9)63	9)45

Make Practice Cards for the hard division facts of 9.

WHICH IS LARGER?

Which is larger, 27, or 180 ÷ 9?
Think: 180 is 18 tens.
18 tens ÷ 9 = 2 tens, or 20.
Therefore 27 is larger than 180 ÷ 9.

Copy the numbers below one group at a time. Draw a line around the part that you think is larger. Then work the example to see if your estimate was correct.

	a	*b*	*c*
1.	32, or 186 ÷ 3.	74, or 126 ÷ 2.	79, or 253 ÷ 3.
2.	23, or 157 ÷ 5.	63, or 428 ÷ 6.	37, or 189 ÷ 7.
3.	41, or 186 ÷ 6.	82, or 616 ÷ 8.	56, or 317 ÷ 6.
4.	27, or 164 ÷ 8.	47, or 373 ÷ 8.	86, or 318 ÷ 4.

Estimating Answers

Copy the examples below. Beside each example write what you think the answer will be. Then divide to find the answer. Compare your estimate with the answer.

	a	*b*	*c*	*d*	*e*
1.	2)183	7)289	5)154	2)143	6)324
2.	5)163	6)187	3)268	4)279	5)273
3.	4)185	5)419	6)489	7)498	6)191

9 THINK BACK WHEN DIVISION IS UNEVEN

The Even Division Combinations	A	B	C	D	E	F	G	H
0 9)0	1	2	3	4	5	6	7	8
1 9)9	10	11	12	13	14	15	16	17
2 9)18	19	20	21	22	?	?	?	?
3 9)27								
4 9)36								
5 9)45								
6 9)54								
7 9)63								
8 9)72								
9 9)81								

1. In an example like 9)216 you will need to think 9)21. Let us see how the even division table of 9's will help you to find the right quotient figure in examples of this kind.

2. Study the chart at the left. It shows you that when you see 9)21, you must think back to 9)18, since 9)21 comes between 9)18 and 9)27.

3. Copy the chart on this page and fill in and complete all the numbers in rows A, B, C, D, E, F, G, and H for each of the division combinations of 9.

4. Use the chart you have made to find out what number you should think back to when dividing each of the following numbers by **9**: 28; 47; 66; 22; 14; 87; 79; 8; 82; 74; 57; 49; 68; 60; 43; 35; 10; 38; 30; 85; 23; 5; 78; 62; 70; 51; 40; 33; 17; 25; 3; 65; 55; 89; 16; 77; 58; 39; 46; 84; 71; 37; 11; 7; 42; 32.

FOUR LESSONS IN DIVISION

Set 1. Divide each of these numbers by 9:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	630	51	$7.47	$8.49	430	60	$9.57
2.	347	87	$6.75	$5.84	726	26	$3.67
3.	521	30	$9.18	$7.52	950	85	$8.04

Set 2. Divide each of these numbers by 9:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	218	62	$6.84	$9.48	813	76	$2.09
2.	546	49	$9.63	$7.81	667	53	$8.37
3.	429	78	$4.52	$2.59	931	86	$1.79

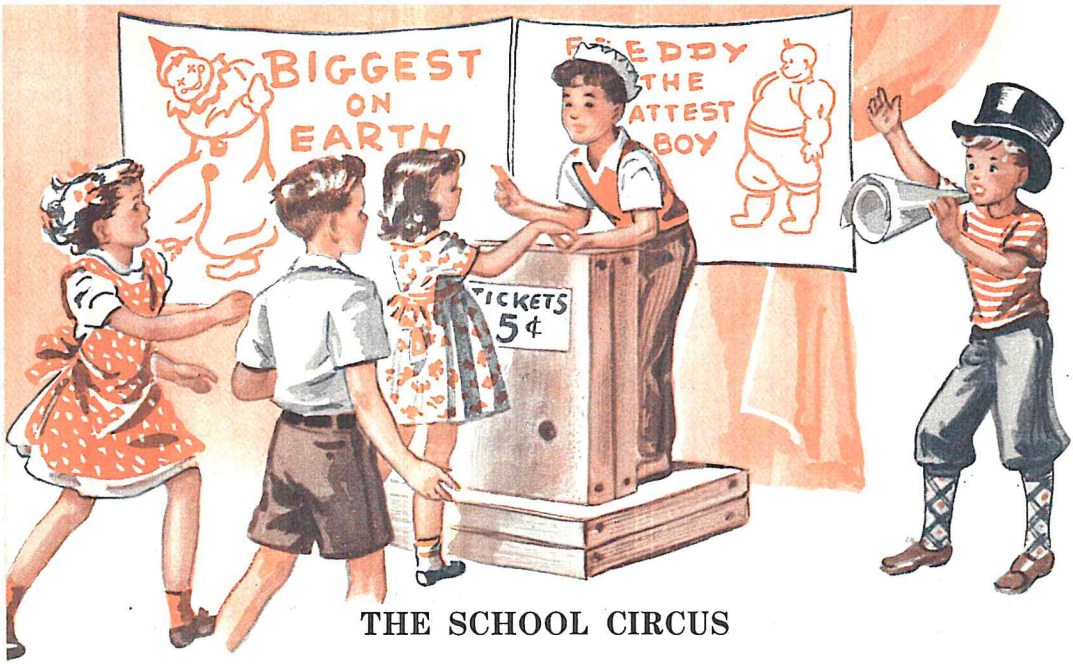
Set 3. Divide each of these numbers by 8:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	292	70	$9.92	$4.75	564	43	$6.45
2.	370	61	$2.88	$7.62	869	79	$9.87
3.	599	54	$7.23	$6.00	487	38	$3.04

Set 4. Divide each of these numbers by 7:

	a	*b*	*c*	*d*	*e*	*f*	*g*
1.	399	98	$4.45	$2.00	634	94	$4.23
2.	598	50	$7.56	$6.63	352	87	$9.77
3.	746	69	$6.12	$3.48	146	53	$4.78

*Numbers to Write: What numbers less than 90 contain 9 with a remainder of 8? of 7? of 6? of 5? of 4? of 3? of 2? of 1?



THE SCHOOL CIRCUS

These boys and girls are giving a circus to raise money to buy a radio for their schoolroom.

1. Joe is the boy in the picture who is selling tickets. He sold 45 tickets at 5 cents each for each show. How much money did he take in altogether if the children gave 3 shows?

2. During the circus, Betty sold peanuts. The children had paid 65 cents for the peanuts. They put them in 45 small bags and sold them for 2 cents a bag. How much money did the fourth grade make on the peanuts?

3. The radio the children wish to buy costs $14.00. How much more money do the children need to raise?

4. Harry said, "We raised half the money by giving the circus." Prove that Harry was right.

*5. Make up three interesting problems about acts that the children might have put on for their show.

SCHOOL DAYS WITH BETTY AND BOB

1. Betty was absent from school for 3 weeks. How many school days was she absent?

2. The teacher grouped 36 children into 9 equal teams for a race. How many children were on each team?

3. On a spelling test Bob spelled 42 words correctly. Betty spelled 39 words correctly. How many more words did Bob have correct than Betty?

4. In the school that Betty and Bob attend, there are 197 children in the lower grades and 249 in the upper grades. How many children attend this school?

5. Bob bought a new reader for 84 cents. He gave his teacher a $5 bill. How much change did he receive?

6. Bob placed the chairs in the gymnasium for the fourth-grade play. He placed 42 chairs. He put 7 chairs in each row. How many rows of chairs were there?

LET'S PRACTICE

44

Watch the signs. Check your work.

1. $.07
5.99
.87
63.95

2. 14645
−4799

3. 7)7490

4. 976
×6

5. 9000
−7481

6. 87¢
×8

7. 9)860

8. 8)$21.36

9. 700
×9

10. $98.87
−65.90

11. $8.70
×7

12. 6)$52.02

13. 466 + 189 + 47 + 987 =

14. $385.94 − $385.88 =

15. 9 × $678 =

THE TIME OF DAY

Time problems for you to study carefully:

1. The recess period is 15 minutes long. It is 10:30 A.M. and recess has just begun. When will recess be over?

$$\begin{array}{r} 10{:}30 \text{ A.M.} \\ +15 \\ \hline 10{:}45 \text{ A.M.} \end{array}$$

Recess will be over at 10:45 A.M.

2. The time by Jane's wrist watch is 3:50, but her watch is 10 minutes slow. What is the correct time?

$$\begin{array}{r} 3{:}50 \text{ P.M.} \\ +10 \\ \hline 3{:}60 \text{ P.M.} \end{array}$$

The correct time is 4:00 P.M. Why?

3. The circus will start at 2:30 P.M. It is now 1:15 P.M. How long will it be before the circus begins?

$$\begin{array}{r} 2{:}30 \text{ P.M.} \\ -1{:}15 \text{ P.M.} \\ \hline 1{:}15 \end{array}$$

It will be 1 hour and 15 minutes before the circus begins.

4. "The next bus will leave in 10 minutes," said the ticket agent. Ted looked at the clock. It was just 4:30 P.M. At what time will the next bus leave?

5. It is 9:30 A.M. What time will it be in 25 minutes?

6. School closes at 3:30 P.M. It is now 3:12 P.M. In how many minutes will school be out?

7. We sometimes say 7:15 like this: **seven fifteen.** Read in this way the following: 8:20; 10:45; 1:50.

8. Here are the hours when certain airplanes are due to arrive at the airport. Which will arrive in the morning hours? Which will arrive in the afternoon or evening?

2:35 P.M.	9:30 A.M.	7:40 P.M.	1:15 A.M.
10:00 A.M.	5:05 A.M.	11:20 A.M.	5:30 P.M.

SOME MONTHS HAVE SPECIAL DAYS

In Box A are some of the special days in the year. In Box B are the months of the year. Match each special day with the month in which it comes. You may use your schoolroom calendar to help you.

A	
1. Easter	10. St. Valentine's Day
2. Flag Day	11. Armistice Day
3. Christmas	12. St. Patrick's Day
4. Labor Day	13. Columbus Day
5. New Year's	14. Lincoln's Birthday
6. Halloween	15. Washington's Birthday
7. Thanksgiving	16. April Fool's Day
8. Mother's Day	17. Memorial Day
9. Father's Day	18. Independence Day

B
January
February
March
April
May
June
July
August
September
October
November
December

1. Name the one month which has no special day.

2. On a grocer's bill, Jerry saw these numbers 4/18/42. His father told him that this was a short way of writing the date. The 4 is the month. What is the 4th month? The 18 is the day. The 42 is the year. It means 1942.

3. Write these dates the short way: Feb. 29, 1936; July 4, 1939; the date of your next birthday; today.

4. Use a schoolroom calendar to find the months with 30 days; 31 days; less than 30 days.

*5. What is meant by Leap Year?

*6. In what seasons do these Special Days come?

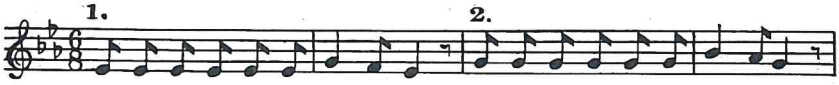
MARTHA'S VIOLIN LESSONS

1. Martha practiced her music 25 minutes on Monday, 30 minutes on Tuesday, and 45 minutes on Wednesday. How long did she practice in all?

2. Martha began to practice her lesson at 4:10. At what time will she be through with her lesson if she practices just 20 minutes?

3. Martha's violin lessons cost 75 cents each. How much do 6 lessons cost?

4. This is the music Martha is playing. Explain how she is using arithmetic in playing it.



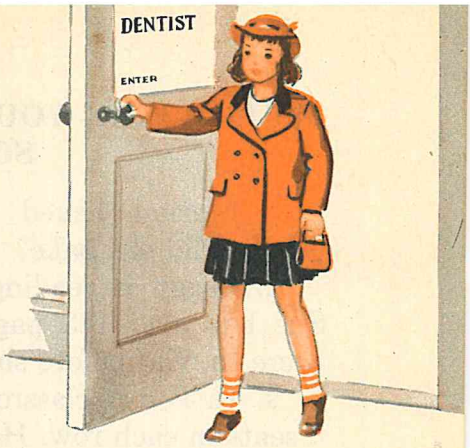
5. Martha kept a record of her practice time last week. How many minutes did she practice each day?

Monday:	from 4:30 P.M. to 4:55 P.M.
Tuesday:	from 7:15 A.M. to 7:35 A.M.
Wednesday:	from 5:05 P.M. to 5:35 P.M.
Thursday:	from 7:10 A.M. to 7:25 A.M.
Friday:	from 4:20 P.M. to 4:45 P.M.

6. On what days did she practice in the afternoon? On what days did she practice in the morning?

7. On what days did she practice longer than 20 minutes? less than 20 minutes?

"SEE YOUR DENTIST TWICE A YEAR"



Elsa goes to her dentist every 6 months to see if any of her teeth need to be filled.

1. This year she visited him in April. Name the month in which she will make her next visit to him.

2. Elsa went into the dentist's office at 3:30. She was through at 4:15. How long was Elsa in the office?

3. Dr. Crane put in one silver filling that cost $2.50. He cleaned her teeth for $.75. Elsa gave him $5.00. How much change did she receive?

*4. Dr. Crane gave Elsa a little box of tooth powder. "You can wash your teeth 50 times with this much powder," he said. Elsa brushes her teeth twice a day. Will the powder last a month?

LET'S PRACTICE

45

1. 564 / 5 / 78 / 986 / 869

2. 8000 − 5749

3. $8.39 × 8

4. 690 × 9

5. 7)985

6. 8)7808

7. $95.06 − 69.07

8. $7.98 / .47 / 8.99 / .78 / 6.78

9. 9)5407

10. $93.70 − 39.87

11. 8000 − 4396

12. $7.58 × 9

13. 700 × 8

14. 8)6832

MEASURING YOUR GROWTH IN PROBLEM SOLVING VII

1. Marion baked 4 dozen cookies. How many cookies did she bake?

2. Peggy is reading a book which has 370 pages. She has read 183 pages. How many more pages are there to read before she has finished the book?

3. In Tony's classroom there are 5 rows of seats with 8 seats in each row. How many seats are there?

4. Four boys earned $1.20 one afternoon mowing lawns. They shared the money equally. How much did each boy receive?

5. George Washington was born in 1732. He died in 1799. How many years old was he when he died?

6. John's father paid $1.71 for 9 gallons of gasoline. How much was the price a gallon?

7. For her birthday party Nancy is planning to give each child 3 sandwiches. There are to be 12 boys and 12 girls. How many children will there be at the party? How many sandwiches will Nancy need?

8. How much does $\frac{1}{2}$ pound of butter cost if butter is selling at 36 cents a pound?

9. Tim had 25¢. He spent 5¢ for a candy bar, and 10¢ for a movie ticket. How much did he have left?

10. Alice bought 2 pencils for 5¢ each and a tablet for 15¢. How much did she spend in all?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

ACROSS THE BRIDGE TO THE NEW CHAPTER

1. Explain the meaning of these words and phrases:

inch	perimeter	average score
10:20 A.M.	city block	average daily attendance
3:35 P.M.	one mile	to double a recipe
leap year	rectangle	estimating answers
length	a rod long	seven fifteen o'clock
square	$\frac{1}{2}$-inch mark	the date, 8/24/41
circle	$\frac{1}{4}$-inch mark	fraction of an inch
width	$\frac{1}{8}$-inch mark	average height

2. Draw lines of the following lengths with a ruler: $3\frac{1}{4}$ inches $4\frac{1}{8}$ inches $5\frac{3}{8}$ inches $2\frac{3}{4}$ inches.

3. Which is more: $\frac{1}{2}$ inch or $\frac{3}{8}$ inch? $2\frac{1}{4}$ inches or $2\frac{3}{8}$ inches? $1\frac{3}{4}$ inches or $1\frac{6}{8}$ inches?

4. How many feet are there in 1 mile? in 3 miles?

5. How many feet are there in 1 rod?

6. Here are John's arithmetic marks for one week: 85, 90, 75, 95, 100. Find his average for the week.

7. Measure the dimensions of this arithmetic book.

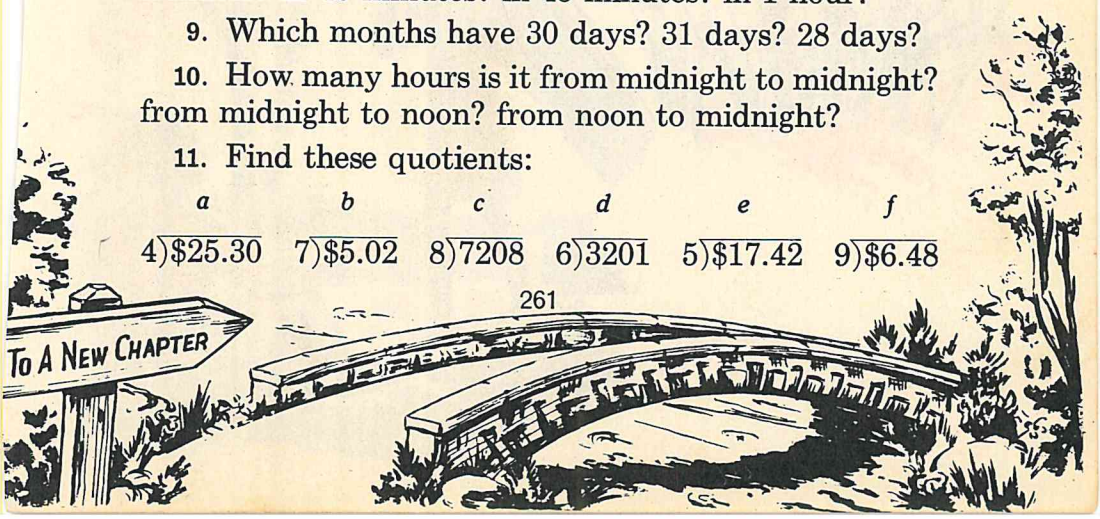
8. It is now 8:15 A.M. What time will it be in 35 minutes? in 40 minutes? in 45 minutes? in 1 hour?

9. Which months have 30 days? 31 days? 28 days?

10. How many hours is it from midnight to midnight? from midnight to noon? from noon to midnight?

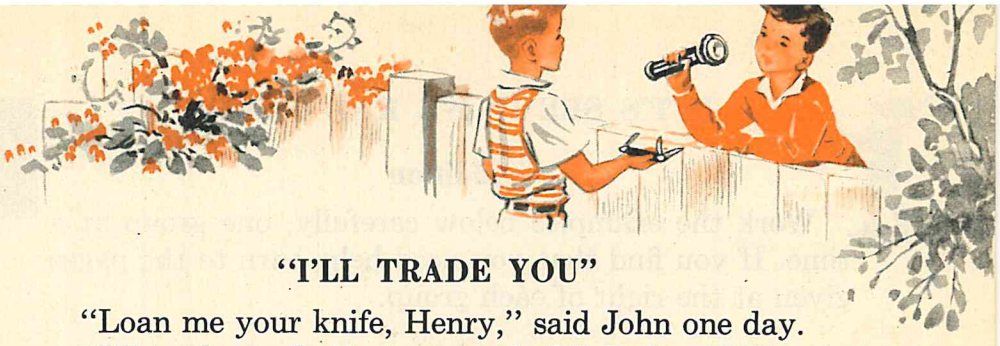
11. Find these quotients:

a	*b*	*c*	*d*	*e*	*f*
$4\overline{)\$25.30}$	$7\overline{)\$5.02}$	$8\overline{)7208}$	$6\overline{)3201}$	$5\overline{)\$17.42}$	$9\overline{)\$6.48}$



CHAPTER VIII

We Learn to Use Fractions



"I'LL TRADE YOU"

"Loan me your knife, Henry," said John one day.

"I'll trade my knife for your flashlight," said Henry.

"My flashlight is worth more than your knife," answered John.

"All right," said Henry, "I'll trade you my knife and give you 25 marbles besides."

"That is fair," answered John. "It's a trade." And that is how John got the knife he needed and Henry got the flashlight he wanted. Was there any money used in this trade?

How People Once Traded

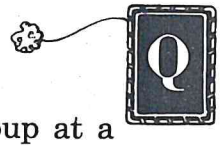
People have not always had money to use in buying and selling. Study the pictures on the opposite page. They show how people traded long ago. Tell what is being "bought and sold" without money.

1. An Indian trader once said he would give a gun for 9 beaver skins. How many guns could an Indian tribe "buy" with 81 beaver skins? with 189 skins?

2. In Africa, one tribe thought that a cow was worth 10 sheep. How many sheep would 8 cows buy?

3. It took an Indian one month to make a canoe. It took another Indian 2 months to catch 24 beavers and get the skins. How many beaver skins would make an even trade for the canoe?

LET'S SEE IF WE KNOW HOW



Addition

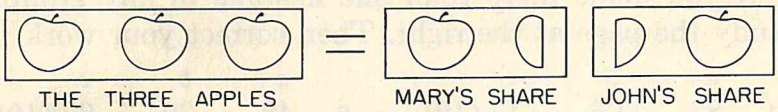
Work the examples below carefully, one group at a time. If you find that you need help, turn to the pages given at the right of each group.

	a	*b*	*c*			*a*	*b*	*c*	
1.	10	4	32	(11)	2.	17	9	38	(13)
	1	22	7			6	45	9	
3.	347	787	479	(13)	4.	536	8	37	(13)
	428	350	774			89	696	549	
5.	5	9	6	(6)	6.	9	8	9	(6)
	6	3	4			6	8	8	
	7	4	8			8	7	4	
								8	
7.	11	35	60	(101)	8.	17	66	56	(101)
	35	20	27			75	36	8	
	33	41	42			98	9	79	
						76	82	58	
9.	259	563	539	(101)	10.	97	55	43	(101)
	779	956	837			7	46	66	
	162	600	308			64	12	82	
11.	$6.86	$.48	$8.57	(104)	12.	$4.54	$6.00	$9.48	(104)
	.67	2.71	.01			7.60	.13	70.65	
	8.91	9.05	.16			18.71	37.96	2.04	
						.95	.04	42.35	

	a	*b*	
13.	$7 + 43 + 59 + 43 =$	$3 + 232 + 64 + 582 =$	(104)

SHARING APPLES

1. Mary and John together have 3 apples. How can 3 apples be divided equally between them?



See the picture of the 3 apples at the left. The picture at the right shows how many each had after sharing them. One apple was cut in halves. Tell why.

We can find the answer by division.

$$\begin{array}{r} 1\tfrac{1}{2} \\ 2\overline{)3} \\ \underline{2} \\ 1 \end{array}$$

Divide 3 by 2. There is a remainder of 1. Divide 1 by 2. We write the result $\frac{1}{2}$ as shown at the left.

2. Show with pictures how Mary and John might share 5 apples. Then find the answer by division as explained above.

3. Study the work below and show that it is correct.

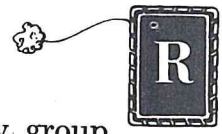
a	*b*	*c*	*d*
$\begin{array}{r} 9\tfrac{1}{4} \\ 4\overline{)37} \\ \underline{36} \\ 1 \end{array}$	$\begin{array}{r} 7\tfrac{2}{5} \\ 5\overline{)37} \\ \underline{35} \\ 2 \end{array}$	$\begin{array}{r} 6\tfrac{5}{8} \\ 8\overline{)53} \\ \underline{48} \\ 5 \end{array}$	$\begin{array}{r} 9 \\ 3\overline{)27} \\ \underline{27} \end{array}$

Divide these numbers as shown above:

	a	*b*	*c*	*d*	*e*
4.	$2\overline{)7}$	$2\overline{)15}$	$3\overline{)19}$	$3\overline{)26}$	$4\overline{)7}$
5.	$5\overline{)9}$	$5\overline{)18}$	$6\overline{)53}$	$7\overline{)25}$	$7\overline{)67}$
6.	$8\overline{)9}$	$9\overline{)49}$	$8\overline{)69}$	$9\overline{)80}$	$8\overline{)43}$

7. Mary cut a piece of cloth 7 yards long into 4 equal pieces. How long was each piece of cloth?

LET'S SEE IF WE KNOW HOW



Subtraction

If you make more than one mistake in any group, study the page at the right. Then correct your work.

	a	*b*	*c*	
1.	87	96	47	**(19)**
	42	3	7	

	a	*b*	*c*	
2.	48	39	62	**(19)**
	45	35	62	

3.	863	385	571	**(19)**
	234	227	532	

4.	548	620	809	**(19)**
	260	150	764	

5.	731	524	907	**(19)**
	293	335	898	

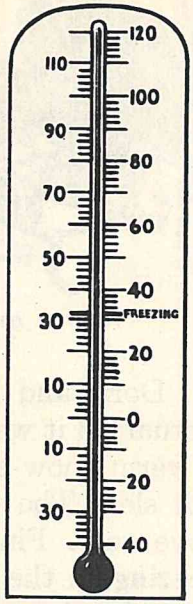
6.	631	250	786	**(19)**
	54	45	7	

7.	500	900	700	**(48)**
	173	509	662	

8	700	400	800	**(48)**
	94	28	7	

	a	*b*	*c*	*d*	*e*	
9.	$4.34	$5.32	$8.45	$3.50	$6.00	**(107)**
	2.47	.87	8.38	2.56	5.94	
10.	$19.67	$13.74	$98.58	$53.23	$427.21	**(107)**
	12.90	7.48	95.99	.28	427.15	
11.	7016	3601	9040	4792	8060	**(200)**
	5460	3487	6782	1916	7979	
12.	18285	29042	11971	35264	55976	**(200)**
	4869	7099	9078	4989	6798	
13.	16300	9000	40003	98000	80900	**(208)**
	9953	4147	5836	93680	14325	

HOW WE MEASURE TEMPERATURE



1. Today the outdoor thermometer looks like the one in the picture. Find the **glass tube**; the **bulb**; the **scale** that marks off every 2 degrees; the numbers which show every 10 degrees. (10°). The ° is the sign that means **degree.** The liquid in the tube is **mercury.** How many degrees does the mercury in this thermometer show?

2. **Zero** is marked **0.** Find it on the thermometer. Have you ever lived where it is as cold as zero in the winter?

3. The temperature at which water will freeze is marked **Freezing Point**. How many degrees above zero (0°) is the **Freezing Point**?

4. Get a real thermometer. What temperature does the mercury in the thermometer show? Place your finger on the bulb. Does the mercury rise or fall? Place the bulb in cold water. Does the mercury rise or fall?

5. What will cold cause the mercury in the tube to do? What will heat cause it to do?

6. Show on a real thermometer where the mercury stands when the temperature is 58°; 62°; 14°; 78°; 0°; 10° below zero; 20° below zero.

*7. Keep a record of the temperature of your schoolroom at 10 A.M. each day for a week.

THE THERMOMETER

1. Doris and Don live in northern Minnesota. On February 8 it was snowing. The air was crisp and cold. In warm snow suits the children coasted downhill on their sled. The thermometer showed that it was 15° above zero. Find 15° on a real thermometer. Find **Freezing** on the real thermometer. How many degrees below freezing was it? Find 0° on the thermometer. How many degrees above zero was it?

2. Their cousin, Howard, lives in the sunny south. On February 8 it was so warm that Howard tried to keep cool by turning the hose on himself. It was 98° in the shade. Find 98° on a real thermometer.

3. Can you explain why there are such differences in temperature in our country on the same day?

4. What is the temperature today on a real thermometer? How much warmer was it on February 8 where Howard lived than the temperature your thermometer shows today?

*5. Find the report of the Weather Bureau in a daily paper. What information does it contain?

BARTER BUSINESS TODAY

1. The Eskimo of Northern Canada barters at the Trading Post for the things he hunts and catches. Etak lived 300 miles from the Trading Post. He made 2 trips each year to the Post. How many miles a year does Etak travel to do his "shopping"?

2. Etak had 5 seal skins which he traded for a gun. If the gun cost the Trading Post operator $75.00, how much on the average did Etak receive for each seal skin?

3. Recently one European government traded 1,200,000 tons of iron ore to another government for 50,000,000 bushels of wheat. Read these numbers.

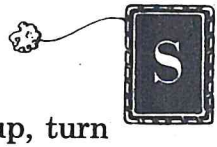
LET'S PRACTICE

46

Work these examples. Check your work carefully.

1. 898 + 787 + 79 + 989 =
2. 9786 − 4869 =
3. 698 × 9 =
4. 6)2442
5. $47.00 − 46.37 =
6. 7)418
7. $6.95 × 7 =
8. $.79 + 6.98 + 6.77 + 8.88 =
9. 4)928
10. 7000 − 4598 =
11. 950 × 8 =
12. 800 × 6 =
13. 6697 − 5769 =
14. 9)$6.84

LET'S SEE IF WE KNOW HOW



Multiplication

If you make more than one mistake in a group, turn to the page number at the right. Correct your work.

	a	*b*	*c*			*a*	*b*	*c*	
1.	40	52	91	**(28)**	2.	48	69	37	**(28)**
	6	4	7			5	8	6	
3.	371	693	790	**(79)**	4.	916	609	316	**(80)**
	8	3	5			4	9	5	
5.	385	879	625	**(81)**	6.	601	444	236	**(81)**
	9	8	8			7	8	3	
7.	$.29	$.84	$.47	**(116)**	8.	38¢	35¢	95¢	**(116)**
	2	4	9			2	7	6	

	a	*b*	*c*	*d*	*e*	
9.	25 cents	47 cents	58 cents	16 cents	50 cents	**(116)**
	5	2	3	2	2	
10.	$1.29	$3.07	$2.41	$24.87	$26.18	**(117)**
	9	4	3	7	6	

*For Those Who Do Not Need More Practice

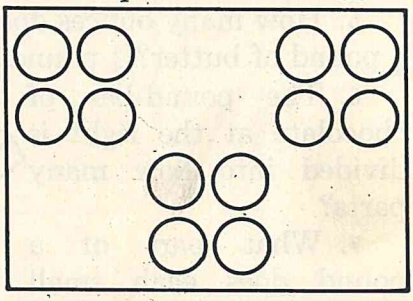
Make up a problem about the following things for the class to work:

1. your toys.
2. your playmates.
3. your schoolroom.
4. your birthday.
5. some money you earned.
6. your favorite game.
7. some money you spent.
8. a holiday you like.
9. a trip you have taken.
10. a party or a picnic.

PICTURING PARTS OF GROUPS

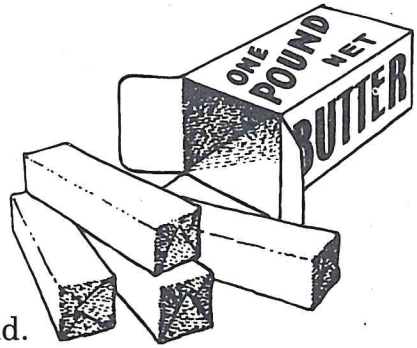
If you divide anything into four equal parts, each part is one fourth of the whole.

1. The twelve eggs above are divided into 4 equal groups. What part of the eggs are in each group?
2. Show that $\frac{1}{4}$ of 12 = 3.
3. How many eggs are there in two fourths of the groups? You can see that $\frac{2}{4}$ of 12 = 2 × 3, or 6.
4. How many eggs are there in $\frac{3}{4}$ of all of the eggs?
5. The circles at the right are divided into how many equal groups? What part of all the circles are there in each group? How much is $\frac{1}{3}$ of 12?



6. How many circles are there in $\frac{2}{3}$ of the circles?
7. Draw groups of small circles like those at the right above. Shade $\frac{1}{3}$ of the circles. How many of the circles are not shaded? What part of the circles are not shaded?
8. Draw a picture of 12 circles divided into fourths. How many of the circles must you shade to shade $\frac{3}{4}$ of the circles? Shade $\frac{3}{4}$ of the circles you drew.
9. How many are $\frac{3}{4}$ of 16 circles?
10. How many are $\frac{1}{3}$ of 6? $\frac{2}{3}$ of 6?

MORE THAN ONE PART OF A WHOLE



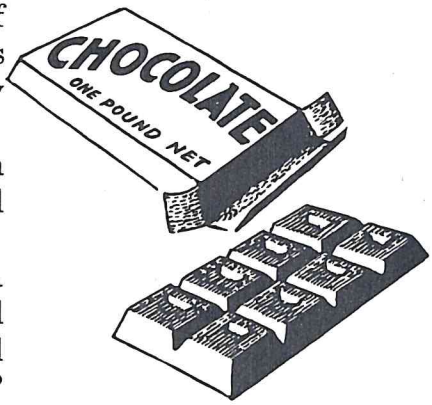
1. The pound of butter in the picture is divided into four equal parts. What part of a pound does each part weigh?

2. How much do 2 of the parts weigh? Think: One part weighs $\frac{1}{4}$ pound. So two parts weigh $\frac{2}{4}$ pound.

3. How much do 3 of the parts weigh?

4. How many ounces does $\frac{1}{4}$ pound of butter weigh? Remember: 1 lb. = 16 oz.

5. How many ounces does $\frac{2}{4}$ pound of butter weigh? $\frac{3}{4}$ pound of butter? $\frac{4}{4}$ pound of butter?



6. The pound-bar of chocolate at the right is divided into how many parts?

7. What part of a pound does each small part weigh?

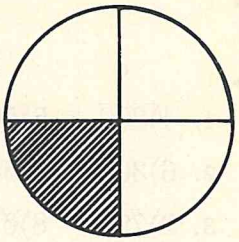
8. What part of a pound do 3 of the small parts weigh? 5 of the small parts? 7 of the small parts?

9. How many ounces does each small part weigh?

10. How many ounces does half of the bar weigh?

11. If butter sells at 36 cents a pound, how much does $\frac{1}{4}$ pound cost? How much does $\frac{3}{4}$ pound cost?

THE MEANING OF LARGER FRACTIONS



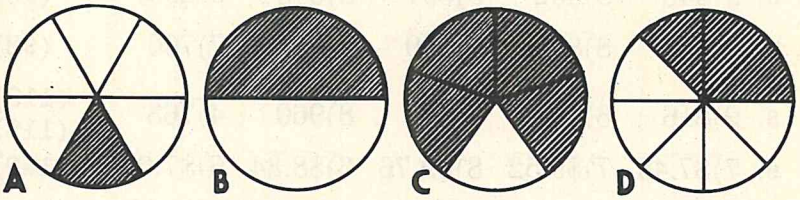
1. What part of the circle at the right is shaded?

2. How many of the parts are not shaded?

We can write the words, three fourths, like this: $\frac{3}{4}$.

The $\frac{\ }{4}$ shows into how many equal parts the whole circle is divided. The $\frac{3}{\ }$ shows how many parts of the whole circle are not shaded.

3. Into what fractional parts is each of these divided?



4. What part of each circle above is not shaded?

5. What part of each circle above is shaded?

6. Draw a circle on your paper. Divide it into fourths. Shade $\frac{3}{4}$ of the circle. What part of your circle is not shaded?

7. Divide a circle into 8 equal parts. Shade $\frac{5}{8}$ of it. What part of the circle is not shaded?

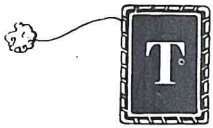
8. Write these fractions with figures:

a. one fourth *c.* three fifths *e.* four eighths
b. one half *d.* five sixths *f.* two fourths

9. Write these fractions with words:

a. $\frac{3}{4}$ *b.* $\frac{3}{10}$ *c.* $\frac{1}{6}$ *d.* $\frac{2}{3}$
e. $\frac{1}{5}$ *f.* $\frac{5}{8}$ *g.* $\frac{7}{8}$ *h.* $\frac{6}{8}$

LET'S SEE IF WE KNOW HOW



Division

	a	*b*	*c*	*d*	*e*	
1.	4)800	5)50	7)770	4)408	5)505	**(36)**
2.	6)300	9)549	8)640	5)200	4)368	**(36)**
3.	9)79	8)61	9)70	9)50	8)38	**(59)**
4.	6)96	7)84	5)95	6)78	4)72	**(61)**
5.	8)99	7)97	6)87	5)93	4)66	**(66)**
6.	9)846	8)552	9)657	8)643	9)256	**(90)**
7.	9)963	8)840	9)959	4)823	7)760	**(98)**
8.	9)816	8)565	9)457	8)960	4)763	**(118)** **(119)**
9.	7)$7.49	7)$9.52	8)$9.76	6)$8.34	6)$7.68	**(140)**
10.	7)$4.13	8)$7.52	9)$8.28	9)$4.32	7)$3.36	**(142)**
11.	6)$4.72	9)$9.32	7)$3.55	9)$5.89	5)$8.82	**(241)**

	a	*b*	*c*	*d*	
12.	9)$21.56	8)$50.98	5)$11.90	4)$19.72	**(241)**
13.	9)7870	8)6957	9)4174	9)9473	**(241)**

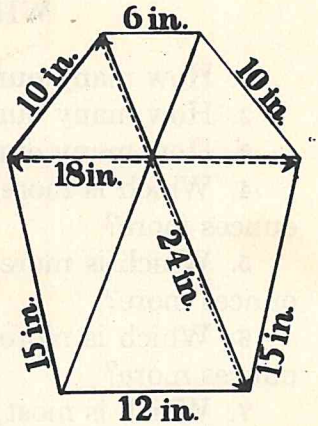
*For Those Who Do Not Need More Practice

For what measures are these the abbreviations?

in.	**yd.**	**rd.**	**bu.**	**pt.**	**gal.**	**hr.**	**A.M.**
ft.	**lb.**	**mi.**	**pk.**	**qt.**	**oz.**	**min.**	**P.M.**

Why is it helpful to know these abbreviations?

MAKING A KITE



Tom is making a kite like the one shown in the drawing.

1. How long is the crosspiece? How much more than a foot is this?

2. How long are each of the two long sticks that run from the top of the kite to the bottom of it? How much longer than the crosspiece is each one?

3. How much less than a yard long is each of the two pieces?

4. The crosspiece must cross the other two sticks at the middle of the crosspiece. How far from the end is the middle of the crosspiece? How can you find the middle of a stick 18 inches long?

5. How many inches of string does Tom need to go around the outside edge of the kite? Allow 10 inches for tying.

6. Will a piece of paper 16 inches wide and 30 inches long be large enough for the kite? Will a piece 20 inches wide and 30 inches long be large enough?

7. Tom made a tail for the kite 3 yards long. How many inches long is it? How many feet long?

8. To fly the kite Tom bought 2 balls of string each containing 600 feet. How many feet of string did he have? How many yards?

9. What is the perimeter of Tom's kite?

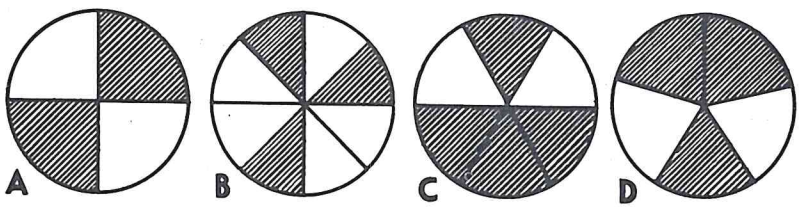
*10. Try to make a kite like Tom's.

WHICH IS MORE?

1. How many ounces are there in $\frac{1}{2}$ pound?
2. How many ounces are there in $\frac{1}{4}$ pound?
3. How many ounces are there in $\frac{1}{8}$ pound?
4. Which is more, $\frac{1}{2}$ pound or $\frac{1}{4}$ pound? How many ounces more?
5. Which is more, $\frac{1}{8}$ pound or $\frac{1}{4}$ pound? How many ounces more?
6. Which is more, $\frac{1}{2}$ pound or $\frac{1}{8}$ pound? How many ounces more?
7. Which is most, $\frac{1}{2}$ pound, $\frac{1}{4}$ pound, or $\frac{1}{8}$ pound?
8. How many minutes are there in $\frac{1}{2}$ hour? in $\frac{1}{4}$ hour? in $\frac{1}{5}$ hour?
9. Which is more, $\frac{1}{2}$ hour or $\frac{1}{4}$ hour?
10. Which is more, 3 quarters or 2 half dollars? How many cents more?
11. Which is more, $\frac{1}{4}$ yard or $\frac{1}{3}$ yard? How many inches more?

What Part Is Shaded?

1. Into what parts is each circle below divided?



2. What part of each circle is shaded?
3. What part of each circle is not shaded?

MEASURING YOUR GROWTH IN PROBLEM SOLVING VIII

1. Helen picked 24 boxes of berries. She sold 18 of the boxes. How many boxes did she have left?

2. Dick rode 5 miles on his bicycle in 45 minutes. How long did it take him to ride one mile?

3. A certain airplane can go 150 miles in an hour. At this speed how far can it go in 8 hours?

4. How much does $\frac{1}{4}$ yard of ribbon cost if the ribbon is 40 cents a yard?

5. Bob has 2 quarters and a nickel. How many cents has he in all?

6. One fourth-grade arithmetic class begins at 9:20 and lasts until 9:55. How many minutes long is the class?

7. Jane had 50 cents. She spent 10 cents for a notebook and 5 cents for a pencil. How much money did she have left?

8. At 9 cents each, how much do 15 one-pound loaves of bread cost?

9. Each school day Grace spends 14 cents to ride to school and 15 cents for lunch. How much does she spend in 5 days?

10. Bruce wants to buy a wire fence to put around his puppy's play yard. The play yard is 10 feet long and 8 feet wide. How much wire fence does he need?

What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10

ACROSS THE BRIDGE TO A NEW CHAPTER

1. Explain these words and phrases:

clerk	perimeter	rising mercury
barter	shopping	falling mercury
mercury	temperature	weather report
customer	thermometer	a 1-inch square
wampum	glass tube	paper dollar
degrees	mercury bulb	one-pound brick
ounces	zero weather	one thousand
a million	freezing point	trading

2. What is the perimeter of a rabbit yard that is 2 feet wide and 4 feet long?

3. How many inch squares would it take to cover a strip 4 inches long and 3 inches wide? Explain your answer.

4. If one strip of wampum contained 360 shell beads, how many beads were needed to make 9 strips of wampum?

5. Name all the kinds of coins we use in our country.

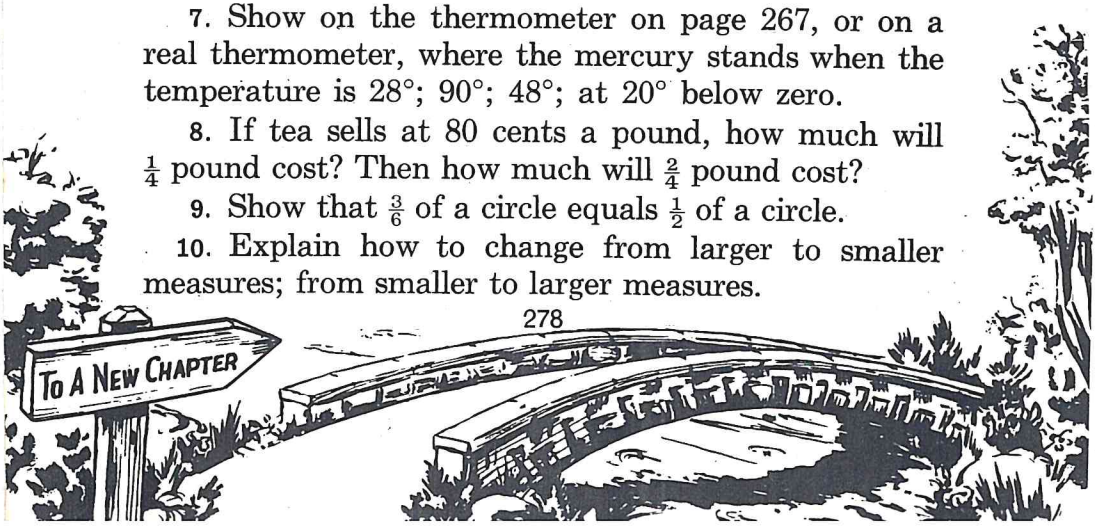
6. List the coins in question **5** in the order of their value, placing the coin of smallest value first.

7. Show on the thermometer on page 267, or on a real thermometer, where the mercury stands when the temperature is 28°; 90°; 48°; at 20° below zero.

8. If tea sells at 80 cents a pound, how much will $\frac{1}{4}$ pound cost? Then how much will $\frac{2}{4}$ pound cost?

9. Show that $\frac{3}{6}$ of a circle equals $\frac{1}{2}$ of a circle.

10. Explain how to change from larger to smaller measures; from smaller to larger measures.



*MAKING REPORTS

Here are some interesting activities. Choose those the class is most interested in or make up other topics.

For each report choose a committee of three pupils. Choose a chairman for each committee by voting. Tally your votes. Each committee will report to the class.

1. A committee to go to the principal to find the enrollment of each grade of your building. This committee will report by grades. The class will total the figures to get the total enrollment for your school.

2. A committee to go to the library to find out about strange ways of telling time in early days.

3. A committee to go to the library to find out about strange things used for money in the early days of barter. Perhaps this committee can have an exhibit.

4. A committee to chart the daily temperature at morning, noon, and night for one week. It will report the average of the 3 temperature readings for each day.

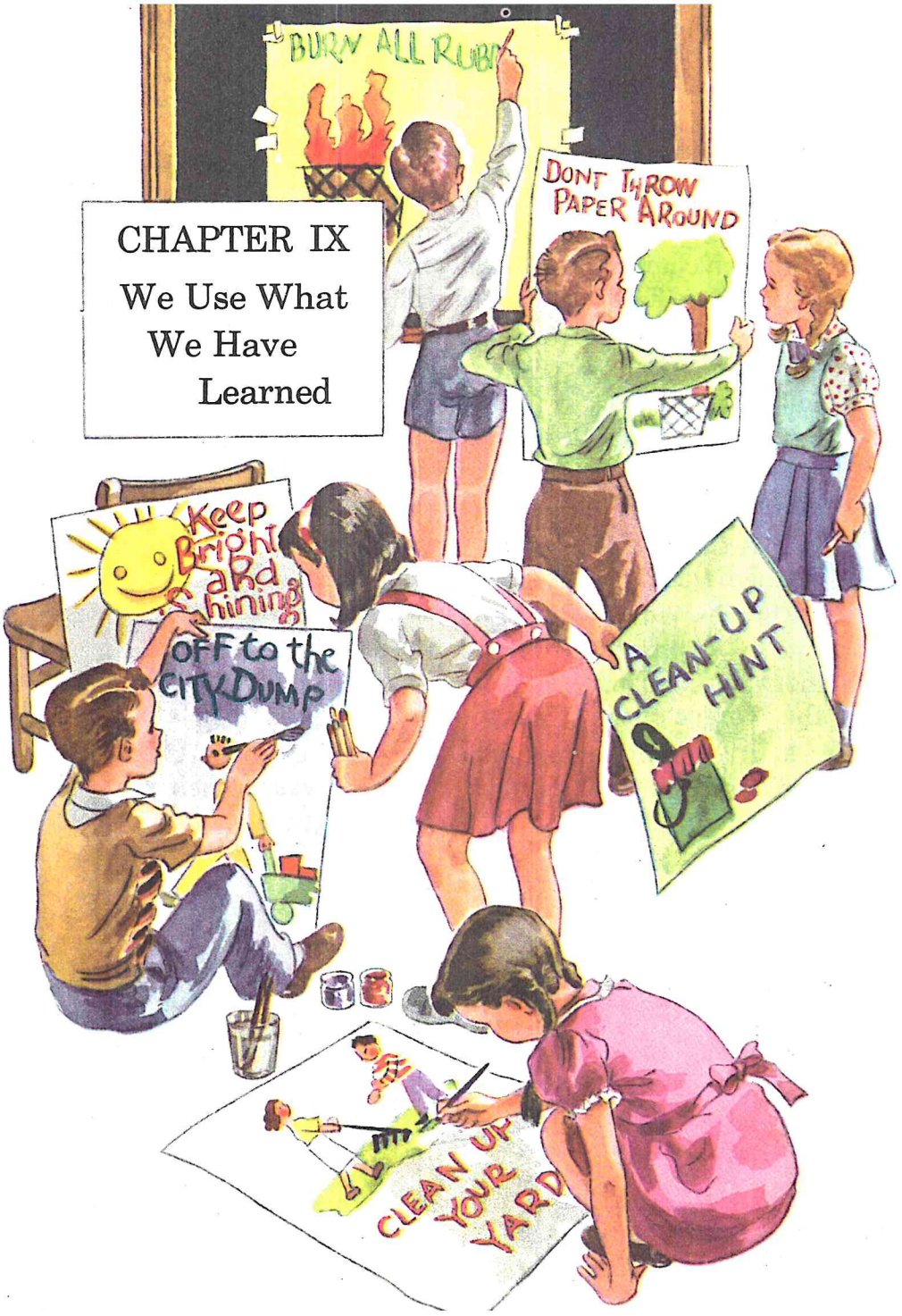
5. A committee to find the cost of each workbook and textbook used in your class this year. Then find the total cost of these textbooks and workbooks.

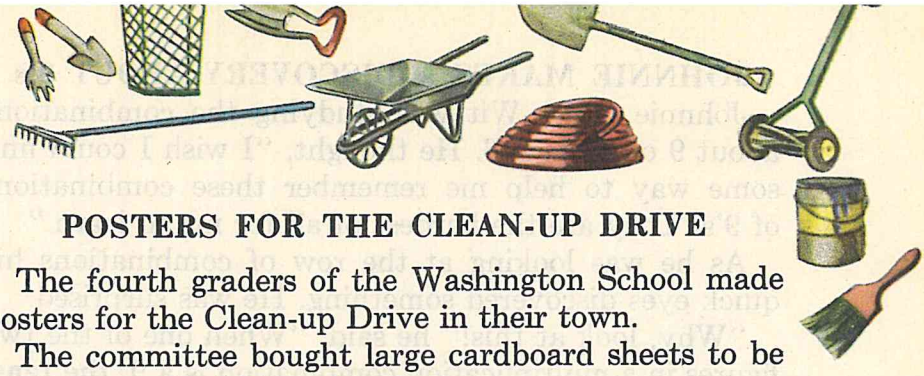
LET'S PRACTICE 47

		a	*b*	*c*	*d*	*e*	*f*	*g*
1.	×8	430	586	712	$9.60	$7.98	$5.12	9384
2.	×9	648	507	931	$9.07	$2.86	$4.51	2389
3.	÷8	360	486	859	$7.20	$9.84	$7.15	5424
4.	÷9	306	637	958	$8.10	$25.65	$8.69	7080

CHAPTER IX

We Use What We Have Learned

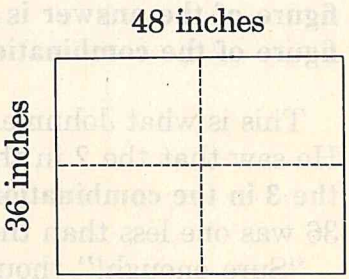




POSTERS FOR THE CLEAN-UP DRIVE

The fourth graders of the Washington School made posters for the Clean-up Drive in their town.

The committee bought large cardboard sheets to be cut into smaller sheets for the posters. The drawing at the right tells you the size of the large sheets of cardboard. The dotted lines show you how each large sheet was to be cut.



1. How long and how wide was each large sheet of cardboard?

2. How many posters were to be made from each large sheet of cardboard?

3. How many large sheets of cardboard were needed, if each of the 36 fourth graders was to make one poster?

4. How long and how wide would each poster be?

5. The children chose $\frac{1}{2}$ of the posters made by their school to take downtown to be put in store and office windows. How many posters were chosen? How many posters were left to be put up in their schoolrooms and halls?

*6. Why do communities have Clean-up Drives?

*7. Give as many reasons as you can why a Clean-up Drive is also a Safety Drive.

*8. What is the date of the Clean-up Drive where you live?

JOHNNIE MAKES A DISCOVERY ABOUT 9's

Johnnie Quick-Wit was studying the combinations about 9 on page 246. He thought, "I wish I could find some way to help me remember these combinations of 9's. They are the hardest of all for me to learn."

As he was looking at the row of combinations his quick eyes discovered something. He was surprised.

"Why, look at this!" he said. "When one of the two figures in a multiplication combination is a 9, **the tens' figure of the answer is always one less than the other figure of the combination."**

This is what Johnnie saw:

$$\begin{array}{r} 3 \\ \times 9 \\ \hline 27 \end{array} \quad \begin{array}{r} 9 \\ \times 3 \\ \hline 27 \end{array} \quad \begin{array}{r} 4 \\ \times 9 \\ \hline 36 \end{array} \quad \begin{array}{r} 9 \\ \times 4 \\ \hline 36 \end{array}$$

He saw that the 2 in the product 27 was **one less than the 3 in the combination,** and that the 3 in the product 36 was one less than the 4 in the combination.

"Sure enough!" thought Johnnie. "I am right." He tested his discovery on each combination.

Check the tens' figure of the products on page 246 and see that Johnnie had made an important discovery.

Then Johnnie's eyes opened wide with surprise. As he was looking at the products he saw that **if he made an addition combination out of the two figures in the product the sum of the figures was always 9.** Check the products on page 246. See 18. Think: 1 and 8 are 9. See 27. Think: 2 and 7 are 9. Is this true of all the products?

Johnnie laughed. "Now I have a way to get the product if I forget one of the 9's. I will figure out the tens' figure first. Then I will think, 'What goes with this number to total 9?' That will be the ones' figure."

SALLY SEE-FAST MAKES A DISCOVERY ABOUT THE 9's, TOO

Sally heard Johnnie Quick-Wit tell the class about his discoveries about the 9's. She thought, "Johnny made a wonderful discovery. But he cannot explain the reason for it. That just happens to be true about the 9's in multiplication."

She tried to think of a better discovery. Suddenly she remembered that when she was in third grade she learned that to help remember 9 **and** 6 when she was adding the numbers she could think, "10 and 6 are 16, but I have added **one too many,** so the sum will be only 15."

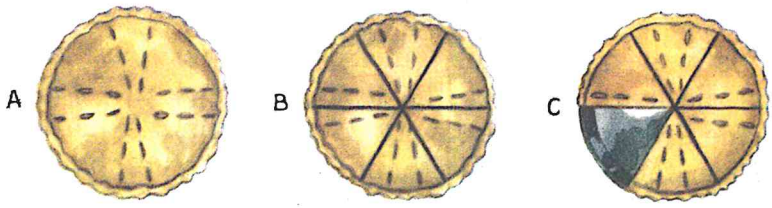
Sally thought, "I think I know a way to remember the 9's. If I forget 9 **times** 6 I could think: 10 times 6 are 60. But that would be **one 6 too many.** So the product will the **one 6 less than 60,** or 54. Then I could remember 6 times 9 because it is **the reverse of 9 times 6.** The product of 6 times 9 is 54, too."

Sally tested out her discovery on 9 times 8. She thought, "10 times 8 is 80, but that is **one 8 too many,** so the product will be **one 8 less than 80 or 72.** Then 8 times 9 is **the reverse of 9 times 8.** The product of 8 times 9 is 72, too."

Test Sally's discovery on the following combinations:

2 ×9 and 9 ×2	4 ×9 and 9 ×4	6 ×9 and 9 ×6	3 ×9 and 9 ×3
5 ×9 and 9 ×5	9 ×9	8 ×9 and 9 ×8	7 ×9 and 9 ×7

USING FRACTIONS IN OUR HOMES



1. Mrs. Olsen bought the pie you see in Picture A. Picture B shows the number of parts into which Mrs. Olsen cut the pie. Into how many pieces was the pie cut?

2. Picture C shows the piece of pie she gave to George when he came home from school. What fraction tells the part of the pie George ate? What part of the pie was left?

3. If George and his mother each have a piece of this pie for dinner, what part of the pie will be left?

4. Yesterday George practiced his cornet lesson for $\frac{1}{2}$ hour. How many minutes was that?

LET'S PRACTICE

48

Use the helps you learned about multiplying by 9.

1. 489×9

2. 307×9

3. 651×9

4. $4{,}098 + 367 + 89 + 5{,}786$

5. $8{,}000 - 7{,}967$

6. $\$2.95 \times 9$

7. $\$7.81 \times 9$

8. $\$6.04 \times 9$

9. $7\overline{)458}$

10. $8\overline{)\$7.84}$

11. $6\overline{)\$9.89}$

12. $8\overline{)483}$

13. 906×9

14. $\$8.35 \times 9$

15. 704×9

JERRY'S NEW DOG IS LOST

1. Jerry went to the newspaper office. He wanted to put this ad in the LOST AND FOUND section of the paper.

> LOST: Small black and white terrier. Answers to name of Zip. Reward. Jerry Jones. Phone Grand 406.

It cost 5 cents for each word to run the ad for 3 days. How much did Jerry pay for the ad? The number 406 is counted as one word.

2. The next evening the phone rang. Zip was found. Jerry paid the man $1.50 for a reward. How much in all did it cost Jerry to get back his dog?

3. To keep his dog home Jerry bought a dog collar for $.65 and a long chain for $.98. How much change did he receive if he gave the clerk $2.00?

*4. Tell why rewards are offered in LOST ads.

*5. Bring to school the LOST AND FOUND ads from a newspaper. Find the cost of running 3 of the ads for 3 days at 5¢ a word.

*6. From the want ad section of a newspaper, list 10 different kinds of things that people advertise. Why is it a good plan to run an ad for 3 days?

LET'S PRACTICE

49

1.	2.	3.	4.	5.
7,865	9,589	$4.68	$3.58	$56.29
7,776	808	8.96	.89	9.25
4,489	7,986	7.09	7.37	.75
	867	9.59	3.56	59.44

SPECIAL PRACTICE IN SUBTRACTION

These subtraction examples will be needed in the new work in division in the next grade. Try to work them all correctly.

Set I

	a	*b*	*c*	*d*	*e*	*f*
1.	54	68	73	90	76	40
	−32	−64	−73	−60	−50	−40
2.	63	61	70	80	72	50
	−35	−56	−53	−76	−67	−42
3.	147	136	120	146	120	118
	−92	−96	−70	−80	−70	−88
4.	104	101	100	104	100	100
	−92	−86	−60	−80	−76	−95
5.	132	113	100	104	114	110
	−95	−87	−93	−89	−76	−92

Set II

	a	*b*	*c*	*d*	*e*	*f*
1.	264	387	465	564	353	341
	−252	−370	−425	−504	−328	−306
2.	540	440	601	400	979	703
	−522	−408	−588	−396	−891	−686
3.	304	658	423	302	621	520
	−244	−588	−390	−270	−588	−462
4.	512	310	256	627	300	410
	−448	−255	−256	−600	−300	−408

UNDERSTANDING CARRYING IN MULTIPLICATION

1. In working these examples in multiplying by 2, what is the largest number you must carry?

28	34	80	39	27	16	45
×2	×2	×2	×2	×2	×2	×2

2. In working these examples in multiplying by 3, what is the largest number you must carry?

37	29	54	18	65	46	82
×3	×3	×3	×3	×3	×3	×3

You can see that the largest number to carry in multiplying by 2 is 1, and in multiplying by 3 it is 2.

3. What is the largest number to carry when multiplying the following numbers by 4? by 5? by 6? by 7? by 8? by 9?

28 73 46 45 37 64 59

4. Is 27 the product of a multiplication combination? Is 29 ever a product of a multiplication combination?

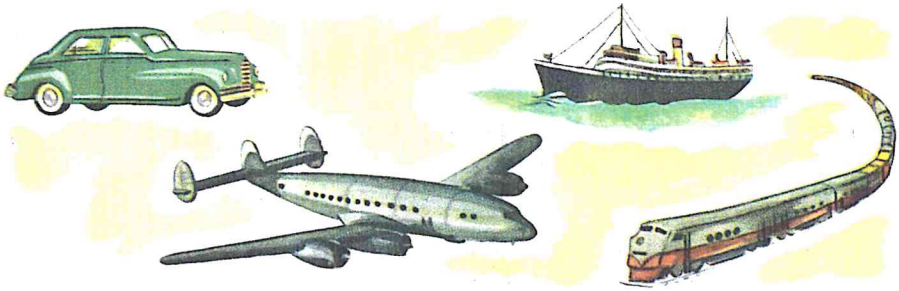
5. The numbers below are all the possible products of all multiplication combinations. Tell what the possible facts are for each product.

0	1	2	3	4	5	6	7	8	9
10	12	14	15	16	18	20	21	24	25
27	28	30	32	35	36	40	42	45	48
49	54	56	63	64	72	81			

6. Which of the above numbers are products of 9? Why are more than 8 never carried to these products?

7. Complete this sentence:

When multiplying by a number you never carry more than . . . . less than the multiplier. (Tell why.)



PEOPLE ARE TRAVELERS

1. On a summer afternoon Ole counted the cars that passed his farm home along a busy highway. In the first five minutes 58 cars passed. In the next five minutes 42 cars passed. How many cars passed in the ten minutes Ole counted them? At this rate what was the average number of cars that passed Ole's home each minute? (How many 10's in 100?)

2. Tim and his father made an airplane trip of 1,280 miles in 8 hours. What was the average number of miles this plane went in one hour?

3. The Brown family are about to cross Lake Michigan on a large lake boat. The boat is to leave at 11:00 o'clock. Jane looked at her watch. It was 10:52. In how many minutes should this boat leave?

50

LET'S PRACTICE

1. 604×8

2. 781×8

3. 295×8

4. $37.89 + .68 + 3.96 + 60.87$

5. $\$60.00 - 59.98$

6. $\$6.51 \times 8$

7. $\$3.07 \times 8$

8. $\$4.89 \times 8$

9. $6\overline{)\$8.94}$

10. $8\overline{)530}$

11. $7\overline{)\$5.64}$

12. $8\overline{)760}$

13. $9\overline{)\$8.01}$

14. 706×8

15. 904×8

16. $\$3.85 \times 8$

SALLY MAKES A DISCOVERY ABOUT 9's

Sally saw these Practice Cards for the division of 9's:

2	3	4	5	6	7	8	9
9)18	9)27	9)36	9)45	9)54	9)63	9)72	9)81

Sally tried to remember these combinations.

She remembered that in multiplication combinations of 9, the two figures in the product always add up to 9 (page 282). She checked the numbers which were divided by 9 on each card. Do the digits in the dividends in the division combinations of 9 add up to 9?

This is what Sally saw: 9)18. Think: 1 and 8 are 9. 9)27. Think: 2 and 7 are 9.

Prove that this is so in the combinations above.

"That means that when a number contains 9 evenly **without a remainder** the figures of the number to be divided by 9 **will total 9** when they are added together." Sally had made her first important discovery.

"I wonder if the quotient has anything to do with the tens' figure," she thought.

Then she made her most important discovery of all. Her sharp eyes saw that when the two figures of a number to be divided by 9 total 9, **then the quotient figure is 1 larger than the tens' figure of the number being divided.**

She saw: 2 The tens' figure of 18 is 1.
9)18 The quotient is 2.

Prove Sally's discovery in the combinations above.

JOHNNIE QUICK-WIT MAKES A NEW DISCOVERY ABOUT 9's

Dividing with Remainders

Sally told the class about her discovery about the division combinations of the 9's.

Johnnie Quick-Wit listened closely. "Sally, that helps when the numbers contain 9 evenly without remainders. To know how many 9's in 63 is easy now. Six and 3 are 9. The quotient will be 1 larger than the 6 of 63. It will be 7.

"But if I have to divide $9\overline{)29}$ the rule won't work. But I see a way. First of all I know there **will be a remainder,** for 2 and 9 total 11 instead of 9. That means I will **have to think back to a number that contains 9 without a remainder.** To divide $9\overline{)29}$ I will think **2 and what number make 9? Because 2 and 7 make 9 I shall think 27.** So to divide $9\overline{)29}$ I must think back to $9\overline{)27}$ to get the quotient."

Next Johnnie tried $9\overline{)32}$. He said, "The figures 3 and 2 in the number to be divided by 9 total 5 instead of 9. So I know there will be a remainder. Three and 6 are 9. But I **cannot think back to 36** when dividing $9\overline{)32}$. I must get a smaller number that has a 2 for a tens' figure. 2 and 7 make 9. So I know that $9\overline{)27}$ is the number I must think back to for $9\overline{)32}$."

1. Use Sally's discoveries to find these quotients:

$9\overline{)45}$ $9\overline{)81}$ $9\overline{)63}$ $9\overline{)27}$ $9\overline{)54}$ $9\overline{)36}$ $9\overline{)72}$ $9\overline{)18}$

2. Use Johnnie's way to find the number to think back to: $9\overline{)48}$ $9\overline{)57}$ $9\overline{)34}$ $9\overline{)61}$ $9\overline{)24}$ $9\overline{)76}$ $9\overline{)52}$

BUYING AT A SAVING

1. On a Saturday sale what did Don find was the sale price of the 25-cent handkerchiefs? Don bought 6 handkerchiefs. How much money did he save on each handkerchief? on 6 handkerchiefs?

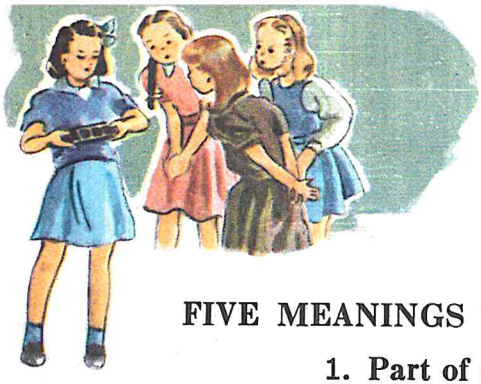
2. Don needed a new tablet. The 5-cent tablets contained 40 sheets. The large Jumbo 10-cent tablets contained 100 sheets. How many sheets would Don get for each penny if he bought the 5-cent tablet? the 10-cent tablet? How many more sheets would he get if he bought the 10-cent tablet than if he bought two 5-cent tablets?

3. Cookies sold in a fancy package were 35¢ a pound. The same cookies sold in a bag from bulk were 28¢ a pound. How much did Beth save by buying 3 pounds of the cookies from bulk?

4. New bicycles cost $37.50. How much money did Jim save by buying a used bicycle for $28.00?

LET'S PRACTICE 51

		a	*b*	*c*	*d*	*e*	*f*	*g*
1.	×8	861	709	845	923	$6.07	$8.51	$8.34
2.	×9	508	961	724	389	$7.51	$6.20	$9.43
3.	÷8	809	564	366	749	$8.64	$2.08	$7.91
4.	÷9	954	456	806	295	$6.21	$4.23	$7.87



FIVE MEANINGS TO FRACTIONS

1. Part of a Group

1. The 36 fourth grade children went on a school picnic. They walked to a near-by woods. For safety they went in four groups. Miss Jackson, their teacher, and Miss Brown, the school principal, went along.

"We will put $\frac{1}{4}$ of the children in each group," said Miss Jackson. She chose John to divide the class into fourths. How many children did he put in each group?

2. Part of One Whole

2. On the way Sally took out a chocolate bar. She shared the bar equally with three of her friends. There were four girls. She broke the candy bar into four equal parts. What part of the candy bar did each girl receive?

3. Fractions in Measuring

3. In his wagon Billy had 38 half-pint bottles of milk. If 1 pint bottle holds as much milk as 2 glasses, $\frac{1}{2}$ pint bottle holds as much milk as how many glasses?

4. Comparing with Fractions

4. Jane saw a group of trees. "Oh, see that crooked little tree," she laughed. "It is only about $\frac{1}{3}$ as tall as that tall tree." Find these trees in the picture.

5. Fractions as Remainders in Division

5. Pat won the jumping contest. Each boy had three jumps. The first time Pat jumped 44 inches. The second time he jumped 37 inches. The third time he jumped 46 inches. What was the average distance Pat jumped?

Here are some more things that happened at the picnic. Which of the five meanings of fractions does each story use?

6. "It took us a half hour to get here," Mike told Miss Jackson. How many minutes did it take us to get here? One-half hour is how many minutes?

7. Tony set the paper plates around two long picnic tables. He put $\frac{1}{2}$ of the 38 plates at each table. Why did they need 38 plates? How many plates did he put at each table?

8. Betty won an apple for winning a race. She divided this apple into two equal parts to share with Sally. What part of the whole apple did each child then have?

9. The children found branches to use for roasting frankfurters. "Billy, your branch is too short. It is only $\frac{1}{2}$ as long as mine," said Miss Jackson. "You are standing too close to the fire." If Miss Jackson's stick was 36 inches long, how long was Billy's stick?

10. They had brought 3 watermelons. How could they divide them equally between the two tables?

WHAT YOU SHOULD REMEMBER ABOUT THE FIVE MEANINGS OF FRACTIONS

1. **Part of a Group.** When Billy put $\frac{1}{2}$ of 38 plates on each of 2 tables, he was dividing the 38 plates by 2. He began with a group of 38 **whole plates.** After he had divided the group in half, **he still had whole plates. One group of whole things was divided into a number of equal smaller groups.**

Turn back to pages 34, 84, 126, 147, and 271 to read again about this meaning of fractions.

2. **Part of a Whole.** When Sally broke her candy bar into 4 equal pieces, she divided it into fourths. Sally started with **one whole candy bar.** She divided it into 4 equal pieces. **One whole thing was divided into a number of equal parts that were smaller than the one whole thing.**

Was each fractional part of the candy bar the same shape as the whole bar? Does the size and shape of a fractional part of a whole thing depend on the size and shape of the whole thing that was divided?

a. Draw pictures to prove that if an apple, a piece of paper, a piece of cloth, a watermelon, or a carpet for a room are each cut in half, the halves will be different in shape from the shape of the whole.

b. Read again pages 32, 33, 272, and 273.

c. To say that $\frac{1}{2}$ of a whole thing is more than $\frac{1}{4}$ of a whole thing, these fractional parts must come from the same whole thing or from different things that are exactly alike. One-half of a foot is not as much as $\frac{1}{4}$ of a yard, because feet and yards are not alike.

3. Fractions in Measuring. The $\frac{1}{2}$ pint bottles of milk in Billy's wagon were **whole bottles.** Why were they called "$\frac{1}{2}$ pint" bottles? This really means **part of a whole.** It means $\frac{1}{2}$ of one whole pint. But to get $\frac{1}{2}$ pint you do not have to take 1 whole pint and divide it in half. You do not even need to have 1 whole pint at the start. If 1 pint of milk could fill 2 glasses, then $\frac{1}{2}$ pint of milk could fill 1 glass. Then one-half pint would mean $\frac{1}{2}$ of two glasses of milk. This means **part of a group** of glasses. So fractions in measuring have **more than one meaning.**

a. Explain the meaning of a half dollar, $\frac{1}{3}$ yard; $\frac{1}{4}$ hour; $\frac{1}{2}$ gallon; $\frac{1}{2}$ foot.

b. Read pages 127, 136.

4. Comparing with Fractions. Jane said, "That crooked little tree is only $\frac{1}{3}$ as tall as that tree beside it." She did not divide trees into 3 equal groups. She did not cut or divide a whole tree into equal parts. She saw that the little tree was about $\frac{1}{3}$ as tall as the larger tree. She was **comparing.**

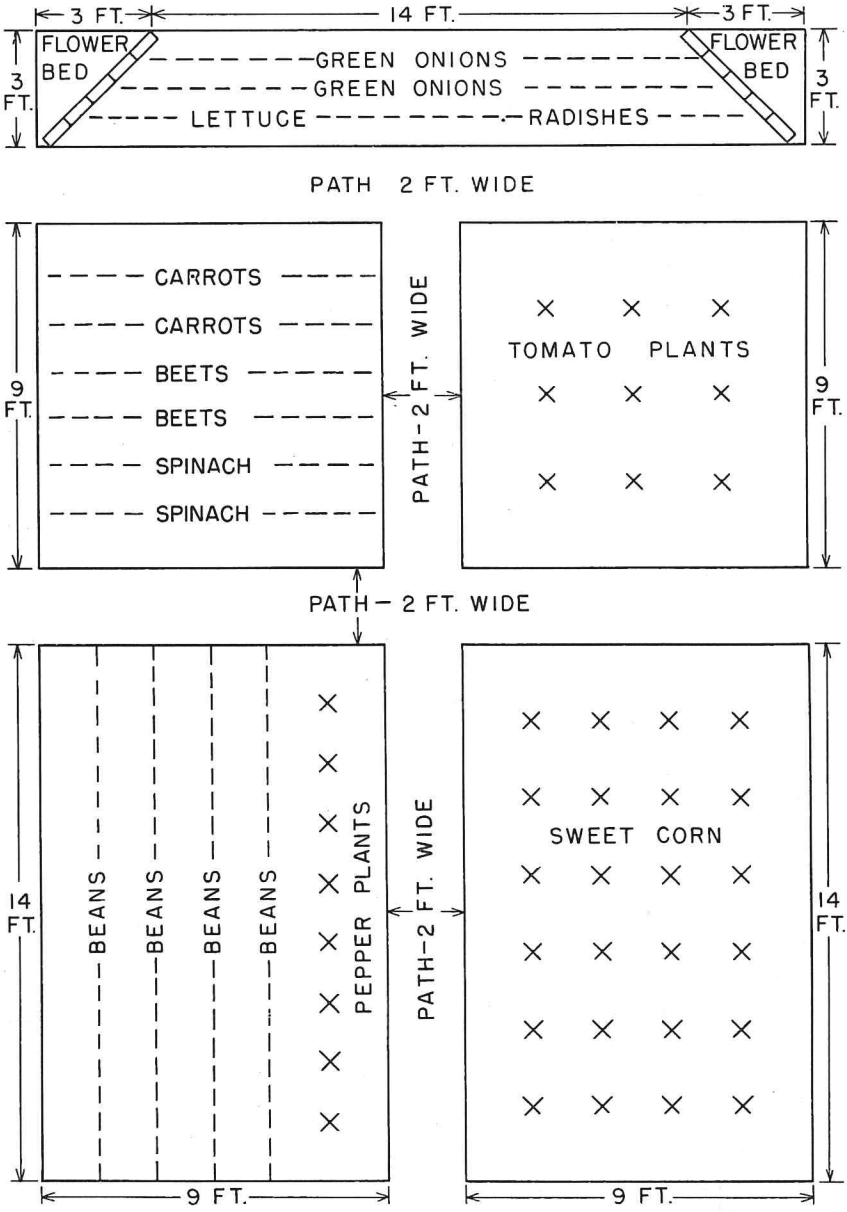
a. Draw pictures to show: one building $\frac{1}{2}$ as high as another; one picture $\frac{1}{3}$ as wide as another.

b. Read about this meaning of fractions on page 194.

c. Prove the pictures in problem *a* are "comparing."

5. Fractions as Remainders in Division. When Miss Jackson divided 3 watermelons between 2 tables, she gave 1 melon to each table. There was 1 melon remaining. But she could cut it in half, and give $1\frac{1}{2}$ melons in all to each table. Explain when remainders can be expressed as fractions.

Read again pages 147, 148.


3 FT.
14 FT.
3 FT.
FLOWER BED
GREEN ONIONS
GREEN ONIONS
LETTUCE
RADISHES
FLOWER BED
3 FT.
3 FT.
PATH 2 FT. WIDE
CARROTS
CARROTS
BEETS
BEETS
SPINACH
SPINACH
9 FT.
PATH-2 FT. WIDE
TOMATO PLANTS
9 FT.
PATH – 2 FT. WIDE
BEANS
BEANS
BEANS
BEANS
PEPPER PLANTS
14 FT.
PATH-2 FT. WIDE
SWEET CORN
14 FT.
9 FT.
9 FT.

READING A GARDEN PLAN

On page 296 is a picture plan of Frank's garden.

1. How many triangle-shaped flower beds are there? Are they the same size? Prove your answer.

2. Find and count all the paths. How wide are they? Why is it a good plan to leave space for paths?

3. How many rows of green onions are there? Are the rows exactly the same length? Give the reasons for your answer.

4. There are two square parts in this garden. Find them. How long and how wide are the square parts in the garden?

5. Count the rows of carrots; of beets; of spinach.

6. How many tomato plants are there in each row? How many rows of tomato plants are there? How many tomato plants are there in all?

7. Two of the rows of beans are wax beans. The others are green beans. How many rows of green beans are there?

8. How long and how wide is the part in which the beans and pepper plants are planted? Find another part just like it. What is planted in it?

9. How many hills of sweet corn are there in each row? How many rows of sweet corn are there? Frank planted 4 kernels of corn in each hill. How many kernels did he need for planting his garden of sweet corn?

10. What is the **total length** and the **total width** of this garden? Do not forget to add 2 feet for each space where there is a path.

*11. Why is it a good thing to make a garden plan?

WHY MOTHER SAYS "EAT YOUR VEGETABLES"

●●●●●	Excellent	Furnishes all you need for one day.
●●●●	Very Good	$\frac{4}{5}$ of what you need for 1 day.
●●●	Good	$\frac{3}{5}$ of what you need for 1 day.
●●	Fair	$\frac{2}{5}$ of what you need for 1 day.
●	Poor	$\frac{1}{5}$ of what you need for 1 day.

You need vitamins and minerals to help you grow strong and healthy bodies. Vegetables give us the vitamins A, B_1, B_2, and C and the minerals calcium and iron. At the bottom of the page is a chart that tells you something about the amounts of vitamins and minerals in some of the vegetables. The chart at the top of the page tells you what the dots in the bottom chart stand for.

Vitamins and Minerals in Vegetables

One 3½ ounce serving	Vitamin A	Vitamin B_1	Vitamin C	Vitamin B_2	Calcium	Iron
Green Lettuce	●●●●●		●		●	●
Beets			●			●
Beet Tops	●●●●●		●●●	●	●●●●●	●●
Parsley	●●●●●		●●●●●			●●
Cooked Spinach	●●●●●		●●●●●	●	●	●●
Turnips			●●●		●	
Turnip Tops	●●●●●	●	●●	●●	●●●	●●
Water Cress	●●		●●●●	●	●●	●●
Celery			●		●	●
Sweet Corn	●●●	●	●	●		
Carrots	●●●●●				●	

READING THE VEGETABLE CHART

Study the chart on page 298 to find the answers to the following questions:

1. Which vegetables listed contain no vitamin A?

2. Which vegetables in the list contain no vitamin B_1? no vitamin B_2?

3. Do all of the vegetables listed contain vitamin C?

4. Which vegetables in the list contain no calcium? no iron?

5. Which of the vegetables listed give us the most vitamin A? vitamin B_1? vitamin C? vitamin B_2? which vegetables listed give the least?

6. Which of the vegetables listed give us the most calcium? the most iron?

7. Which give us the least calcium? the least iron?

8. Which is healthier to eat, a serving of red beets or a serving of the same size of green beet tops?

9. Which is healthier to eat, a serving of turnips or a serving of the same size of green turnip tops?

10. What does the chart teach us about green vegetables such as spinach or beet tops as a health food? Prove your answer.

11. How many ounces in one pound? In $\frac{1}{4}$ pound there are how many ounces? What is the size of the serving used in the vegetable chart? Is the serving just about $\frac{1}{4}$ pound? Prove your answer.

*12. Since vegetables do not contain all the vitamins and minerals we need, find out what other foods also contain them.

*13. Will a second helping of sweet corn change the amount of minerals and vitamins in Bill's dinner?

OPENING THE GATE TO A NEW GRADE

Use this test to find how well you have learned the arithmetic you have studied.

1. What does the $\frac{2}{\ }$ in $\frac{2}{4}$ mean? What does $\frac{\ }{4}$ mean? (32)

2. Tell what **remainder** means in subtraction. Tell what **remainder** means in division. (18, 57)

3. Write the numbers from 1 to 18 that have a remainder of 1 when divided by 2. (58)

4. When 3 is the divisor, what numbers between 1 and 27 have a remainder of 1? a remainder of 2? (62)

5. Why may we call zero a place holder? (74)

6. Write in figures: **nine thousand five.** (75)

7. What does finding $\frac{1}{4}$ of a number mean? Find $\frac{1}{4}$ of 24; 36; 28; 32. (84)

8. When 4 is the divisor, what numbers between 1 and 28 have a remainder of 2? a remainder of 3? (85)

9. Write in figures with $ signs and decimal points: *a.* Ten dollars and 1 cent; *b.* Fifty dollars and six cents. (92)

10. Add: 8 + 897 + 35 + 2,009. (102)

11. When 5 is the divisor, what numbers between 1 and 30 have a remainder of 2? of 3? of 4? (124)

If you have any mistakes correct your work at once. Turn for help to the pages given at the right. Learn the facts you did not know before you go on.

NOTE TO THE TEACHER: Pupils who make no mistakes on the tests on pages 300, 301, and 302 may be assigned the starred exercises on pages 304 to 307.

OPENING THE GATE TO A NEW GRADE

Follow the directions given for the review test on page 300.

1. How many children are there in $\frac{1}{5}$ of a group of 35 children? Is $\frac{1}{5}$ of 45 inches more or less than a foot? (126)

2. How do you work a problem in which you are asked to change **from little measures to bigger measures?** (162-163)

3. How many pints are there in 8 quarts? (136)

4. How many quarts are there in a gallon? in 6 gallons? in 25 gallons? (137)

5. Copy this chart. Fill in the missing numbers. (158)

1 doz. = ? things	1 hr. = ? min.
1 pr. = ? things	1 wk. = ? days
1 ft. = ? in.	1 yr. = ? mo.
1 yd. = ? in.	1 nickel = ? cents
1 yd. = ? ft.	1 dime = ? cents

6. What number must you think back to when dividing these numbers by **6**: 31, 44, 39, 57, 53? (167)

7. Name some things in your classroom that are shaped like circles; like squares; like triangles; like rectangles. Draw one of each. (177)

8. How would you **tally** a score of 23? (203)

9. Write our Arabic numbers for these Roman numerals. (204)

X V C I L XV LXX

10. Write these numbers in the order of their size: 376,008; 376,804; 376,080; 376,000; 376,840. (205)

OPENING THE GATE TO A NEW GRADE

Follow the directions that are given for the review test on page 300.

1. How many pecks are there in 1 bushel? in 8 bushels? (215)

2. Write in figures: three million, four hundred thousand, two hundred eight. (216)

3. Copy this chart. Fill in the missing numbers: (222)

   ? seconds = 1 minute. ? hours = 1 day.
   ? minutes = 1 hour. ? days = 1 week.

4. What do the letters A.M., P.M. mean? (222)

5. What number must you think back to when dividing these numbers by 8: 25, 42, 59, 76, 37, 54, 71? (225)

6. Draw a line $3\frac{3}{8}$ inches long; $4\frac{5}{8}$ inches long. (236)

7. How many feet are there in one mile? (256)

8. Find the average weight of three children weighing 59 pounds, 84 pounds, and 46 pounds. (242)

9. What is the perimeter of a flower bed that is 8 feet long and 6 feet wide? (245)

10. Which is more: 9 x 29, or 250? (249)

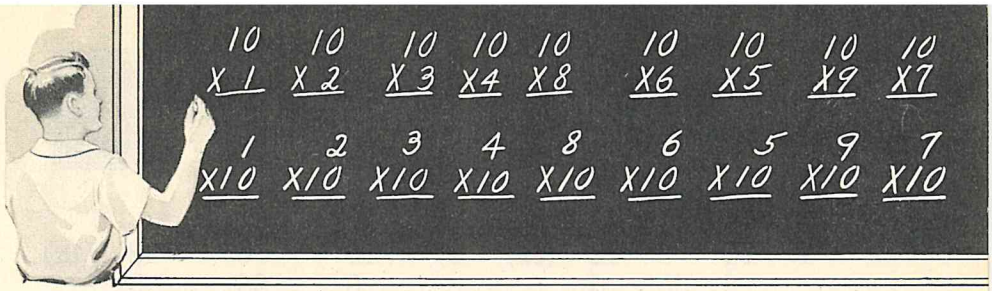
11. Which is larger: 32, or 189 ÷ 3? (251)

12. What number must you think back to when dividing these numbers by 9: 19, 38, 57, 76, 32? (252)

13. Explain this date on a letter: 3/21/47. (257)

14. Which of the following thermometer readings shows the lowest temperature? 62°; 78°; 58°; 52°? (267)

15. Give each of the five meanings of fractions. Give an illustration of each of the five meanings. (292-295)



SALLY'S DISCOVERY ABOUT MULTIPLYING WITH 10's AND 11's

(For Children Who Make No Mistakes on Pages 300-302.)

Sally never needs a pencil when she multiplies 10 by a one-figure number. She says, "**10 is 1 ten and 0 ones.** If I multiply one ten by 8 I just write the number that means **8 tens.** That would be an 8 in tens' place and a 0 in ones' place, or **80.** The reverse of 8 times 10 is **10 times 8.** So 10,8's will be 80, also."

$$\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array} \qquad \begin{array}{r} 8 \\ \times 10 \\ \hline 80 \end{array}$$

1. Without pencil use Sally's discovery to name the products for the combinations on the blackboard.

Sally does not need a pencil either when she multiplies 11 by a one-figure number. She says, "**11 is 1 ten and 1 one.** If I multiply 11 by 6 I have **6 ones** and **6 tens.** That number is 66. So 6 times 11 is 66. The reverse of 6 times 11 is **11 times 6.** So 11 6's are 66, too."

$$\begin{array}{r} 11 \\ \times 6 \\ \hline 66 \end{array} \qquad \begin{array}{r} 6 \\ \times 11 \\ \hline 66 \end{array}$$

2. Use Sally's discovery to name these products:

$$\begin{array}{r} 11 \\ \times 1 \\ \hline 1 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 2 \\ \hline 2 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 3 \\ \hline 3 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 4 \\ \hline 4 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 8 \\ \hline 8 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 6 \\ \hline 6 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 5 \\ \hline 5 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 9 \\ \hline 9 \\ \times 11 \\ \hline \end{array} \quad \begin{array}{r} 11 \\ \times 7 \\ \hline 7 \\ \times 11 \\ \hline \end{array}$$

LET'S SEE IF WE KNOW HOW U

Addition

	a	*b*	*c*			*a*	*b*	*c*	
1.	15	3	42	(11)	2.	19	6	59	(13)
	2	35	6			6	68	9	
3.	226	768	638	(13)	4.	427	9	68	(13)
	537	450	662			94	295	628	
5.	8	6	9	(6)	6.	7	7	9	(6)
	3	4	4			5	7	7	
	8	7	4			8	9	6	
								9	
7.	41	46	50	(101)	8.	29	66	45	(101)
	37	20	34			79	39	6	
	11	23	55			76	8	99	
						88	87	56	
9.	737	984	387	(101)	10.	$4.27	$73.59	$41.65	(104)
	788	87	3			.49	1.10	.91	
	909	500	928			4.98	70.71	1.64	
							7.89	80.03	

*For Those Who Do Not Need Special Help

1. Draw 4 large circles the same size. Draw lines to divide one circle into halves, one circle into thirds, one circle into fourths, and one circle into sixths. Color one of the parts of each circle. Write under each circle the fraction that names the colored part of that circle. **What do you see happens to the size of the part as you increase the number of parts into which these like wholes are divided?**

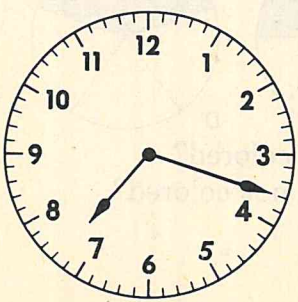
LET'S SEE IF WE KNOW HOW V

Subtraction

	a	b	c			a	b	c	
1.	76	89	36	(19)	2.	59	87	73	(19)
	−42	−3	−6			−54	−85	−73	
3.	753	504	904	(18-19)	4.	651	670	283	(18-19)
	−327	−440	−696			−77	−32	−4	
5.	700	200	400	(48)	6.	$9.73	$8.75	$1.34	(107)
	−455	−97	−8			−5.75	−.87	−1.25	

	a	b	c	d	e	
7.	$57.46	$15.93	$38.57	$24.22	$150.33	(107)
	−49.80	−9.38	−36.98	−.28	−150.26	
8.	6015	6901	7030	5395	8080	(200)
	−2230	−6469	−5753	−3978	−7896	
9.	11865	31427	42516	19542	25327	(200)
	−8146	−4041	−6161	−2619	−1172	
10.	19300	6000	38001	900089	100012	(208)
	−9319	−3974	−20865	−824100	−99800	

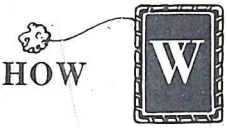
*For Those Who Do Not Need Special Help



What time does this clock face show? How many minutes are there between the present time shown and:

7:28? 7:32? 7:36? 7:45?
7:49? 7:52? 7:58? 8:00?

LET'S SEE IF WE KNOW HOW



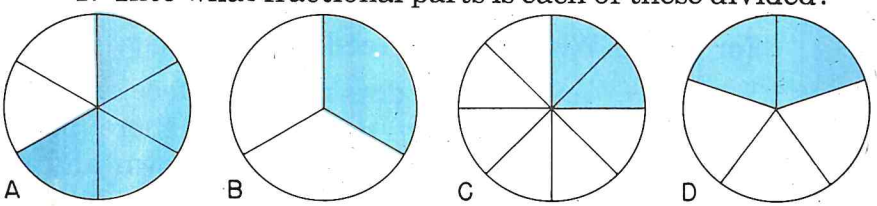
Multiplication

	a	*b*	*c*			*a*	*b*	*c*	
1.	60	82	91	(28)	2.	58	47	29	(28)
	×7	×4	×8			×6	×9	×5	
3.	901	400	620	(79)	4.	480	783	361	(79)
	×4	×4	×3			×8	×3	×9	
5.	914	709	718	(80)	6.	295	725	364	(81)
	×7	×6	×5			×9	×8	×5	
7.	$.39	$.58	$.36	(116)	8.	37¢	70¢	27¢	(116)
	×2	×7	×8			×4	×2	×7	

	a	*b*	*c*	*d*	*e*	
9.	46¢	50¢	49¢	15¢	65¢	(116)
	×6	×5	×3	×2	×4	
10.	$8.90	$3.98	$3.12	$19.85	$24.86	(117)
	×9	×7	×6	×3	×2	

*For Those Who Do Not Need Special Help

1. Into what fractional parts is each of these divided?



2. What part of each circle above is colored?
3. What part of each circle above is not colored?

LET'S SEE IF WE KNOW HOW X

Division

	a	*b*	*c*	*d*	*e*	
1.	3)900	7)70	4)840	2)604	8)808	(36)
2.	5)150	9)729	6)480	4)200	2)182	(36)
3.	9)52	8)70	9)40	8)37	7)54	(59)
4.	5)95	6)90	3)87	4)72	7)98	(61)
5.	3)56	6)99	2)75	5)86	8)98	(66)
6.	5)430	8)768	9)657	6)504	2)170	(90)
7.	2)812	3)621	7)714	4)836	9)954	(98)
8.	9)815	8)403	7)566	4)682	5)703	(118-119)
9.	7)$9.45	9)$9.18	5)$7.60	3)$7.95	4)$9.44	(140)
10.	8)$5.84	7)$4.83	9)$7.38	6)$2.34	4)$1.96	(142)
11.	3)$1.49	6)$1.77	9)$9.50	8)$7.85	7)$7.65	(241)

	a	*b*	*c*	*d*	
12.	9)$86.67	8)$29.20	7)$39.69	6)$34.60	(241)
13.	5)4890	8)5940	7)5901	6)5078	(241)

*For Those Who Do Not Need Special Help

Use the picture of the ruler on page 236 or a real ruler to tell:

How many $\frac{1}{4}$ inch spaces are there in 1 inch? $\frac{1}{2}$ in.? $1\frac{1}{4}$ in.? $3\frac{3}{4}$ in.?

MEASURING YOUR GROWTH IN PROBLEM SOLVING IX

1. Mabel had 50¢ in her purse. She spent 28¢ for a pair of socks. How much money did she have left in her purse?

2. For a program Jerry placed 72 chairs in 8 equal rows. How many chairs did he place in each row?

3. In the school supply room Bill unpacked boxes each containing 144 pencils. How many pencils were there in 9 such boxes?

4. Find the cost of $\frac{1}{4}$ pound of butter at 56¢ a pound.

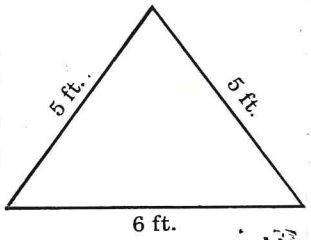
5. At 10 A.M. the thermometer read 68°. At 10 P.M. that same day it read 62°. How many degrees did the temperature drop between 10 A.M. and 10 P.M.?

6. It is 10:35. The train will not arrive until 10:50. How many minutes must Jack wait for this train?

7. Ellen bought 8 colored pencils at 6¢ apiece. How much change did she receive from a 50-cent piece?

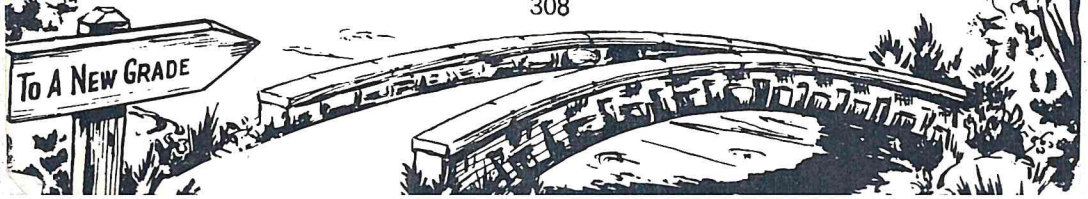
8. Each child needs 9 sheets of notebook paper. How many sheets of this notebook paper will be needed for 35 children?

9. Mary wants to put a wire fence around her triangle-shaped flower bed. How many feet of fence are needed to go around the flower bed pictured at the right? What is the cost of this fence at 6¢ a foot?



What Your Score Means

Unsatisfactory	Fair	Good	Excellent
0 1 2 3 4	5 6	7 8	9 10



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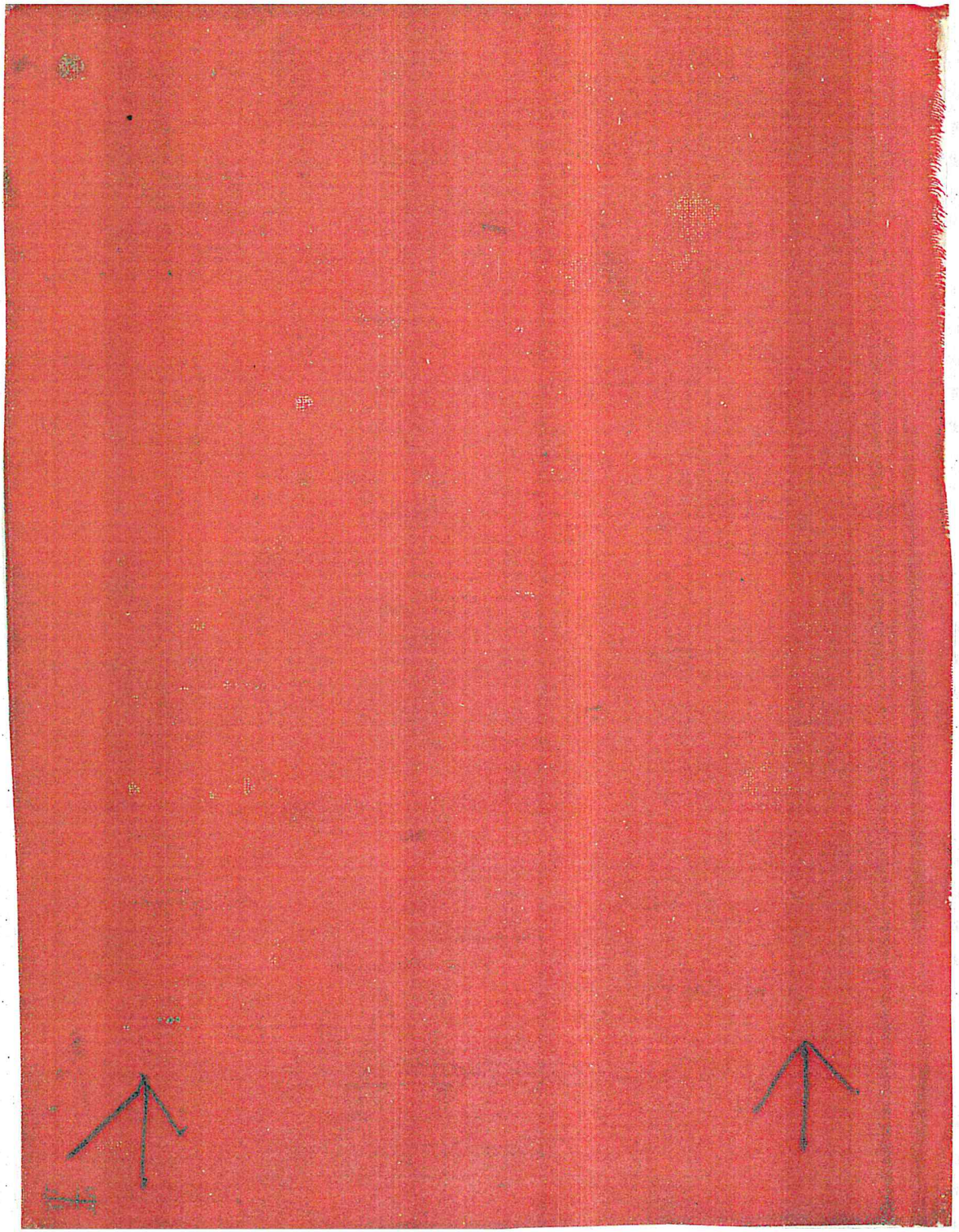
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